Autura 500
Automatic Microplate Filler
User Manual

mikura
technology for science

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1 Unpacking the unit

1.A Unpacking

Place the shipping carton on the floor, open the carton and remove the filler and its components.

☝Note: Lift the main unit out of the box by putting your hands underneath the main body of the washer. It will lift out of the box with its foam packing blocks on each end.
Following the unpacking, make sure that you have all the following components.
Please contact your supplier immediately if you notice any of the components missing or damaged.

☝Note: Do not attempt to assemble a unit using damaged components.

A.	Autura filler	Cat. No. 500
B.	Mains cable with -	
	European mains plug	Cat. No.5520
	British mains plug	Cat. No.5521
	American mains plug	Cat. No.5522
C.	Power supply unit	Cat. No.6005
D.	User manual	Cat. No.500.6000

Retain the packaging for any future shipping needs.

The remote power supply unit is a Switch Mode Power Supply and automatically adjusts to the main supply characteristics and will work with any voltage from 110V to 250V and 50/60Hz.

1.B Positioning

Autura requires an operation environment of between 10 ºC – 40 ºC

The fully assembled Autura 500 occupies a work surface area of 40cm width and 55cm depth; clear this area on your bench and position it to the left of this space. Autura is fitted with levelling feet on each corner; adjust them so the unit is horizontal and level.

Your reagent bottle should be positioned to the right of the filler unit.

Conveniently place the remote power supply so the lead can easily be attached to the filler, insure that it is not covered and has access to a free flow of air over it.

2 The socket panel

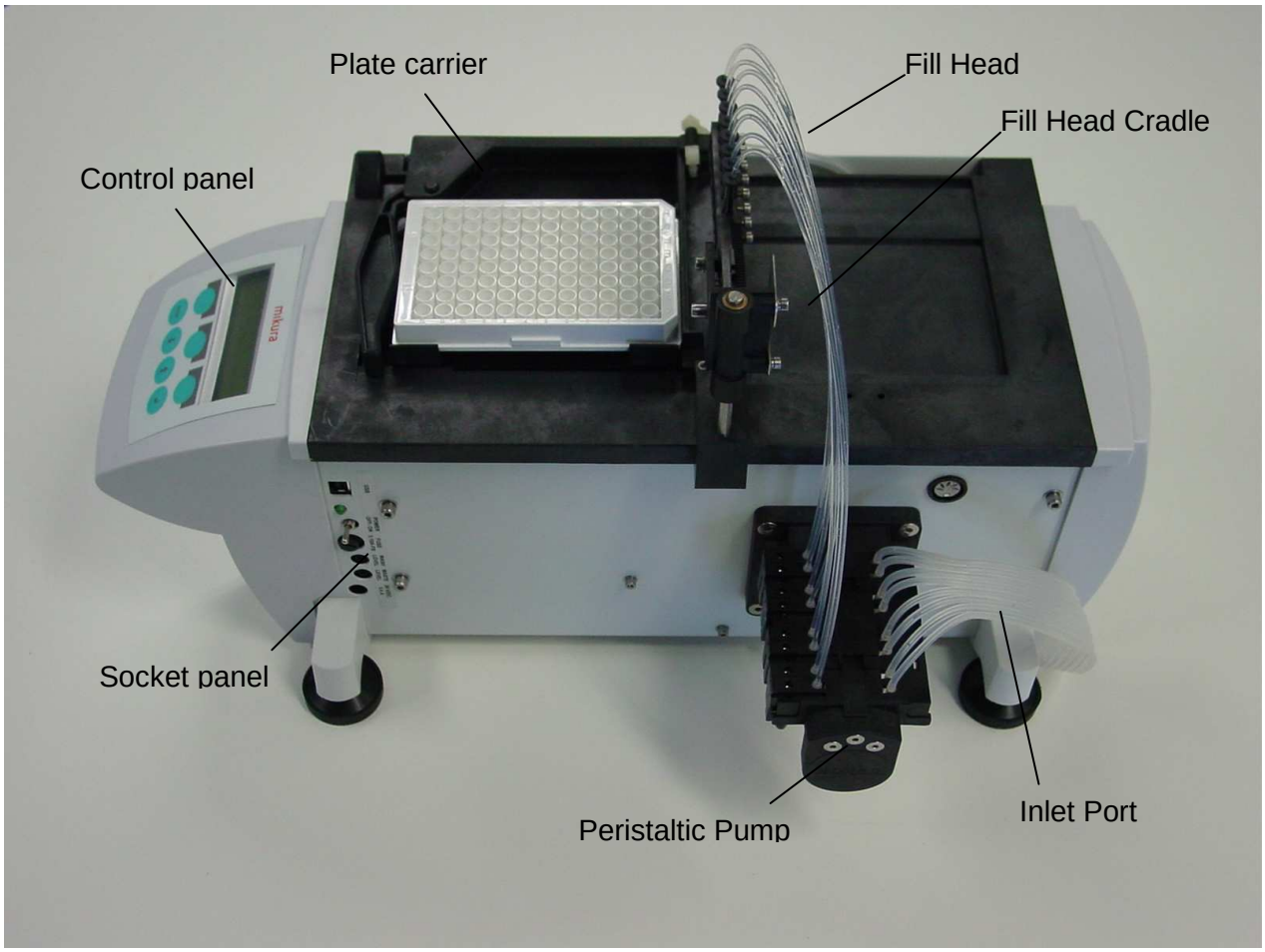
The socket panel is located on the right hand side of Autura and contains the following:

1. USB socket for software upgrades.
2. ‘Power On’ green LED which illuminates whenever the unit is switched on.
3. Power On/Off switch.
4. Fuse Holder containing a F3.15A fuse.
5. Mini stereo socket for liquid level sensing from the wash bottle
6. Mini stereo socket for liquid level sensing from the waste bottle
7. A 5.0mm power socket that connects to the remote power supply.

3 Assembly

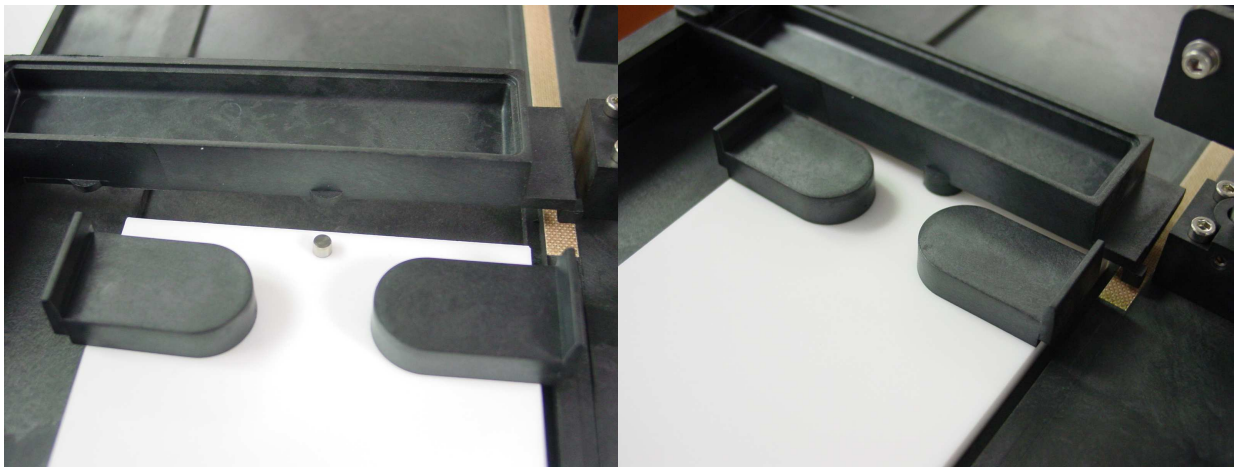
3.A General assembly

1. Remove all packing material from the head and plate carrier area.
2. Plug the power supply cable into the socket on Autura's sockets panel.
3. Plug the mains cable into the remote power supply unit and the mains plug into your main supply. Do not switch on the unit at this time.
4. Fill your reagent bottle with the chosen reagent. Connect the 8 way silicone ribbon tubing from the reagent bottle to the inlet (back) tubes on the peristaltic pump.
5. Connect the clear FEP tubing, which leads from the outlet (front) ports of the peristaltic pump onto the top spigots on the filler head.
6. Put the clear silicone tubing from the prime trough pump into a suitable receptacle.
7. Power up the unit using the toggle switch on the socket panel. The back illuminated LCD will display the message 'Autura 1000 Welcome'.



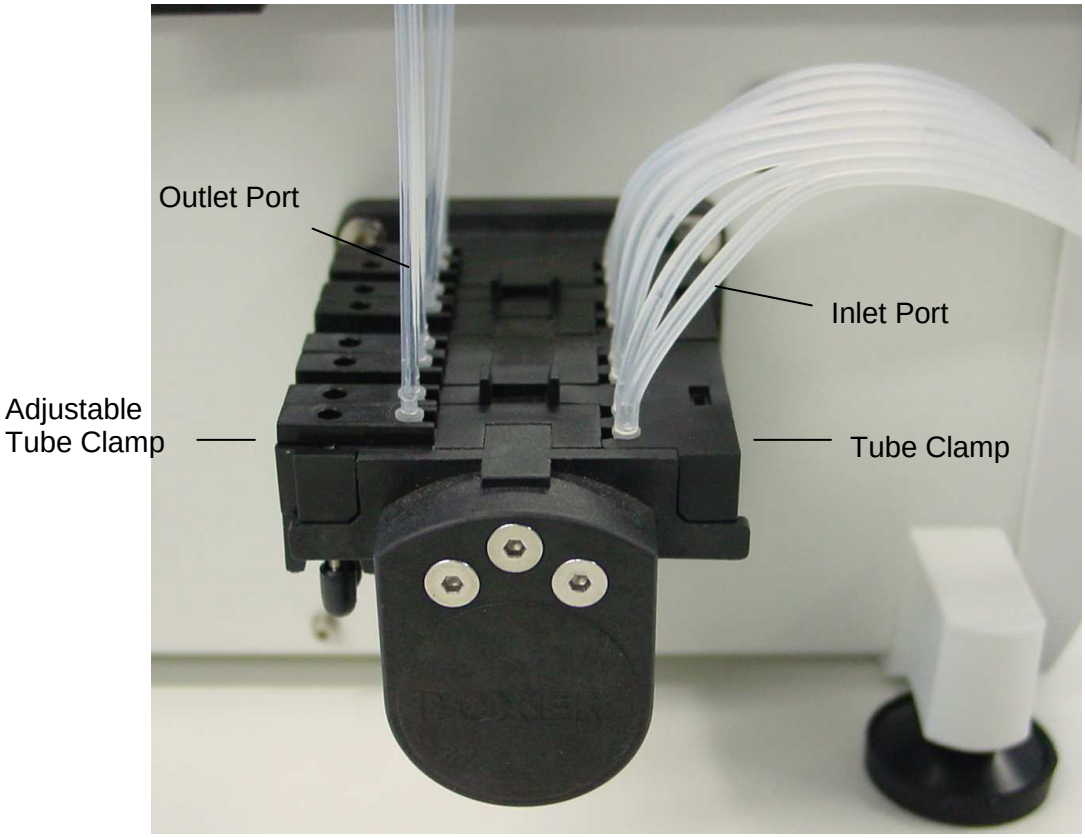
3.B Microplate platform

The microplate sits on a PTFE platform. This is attached to the plate carrier with a 4mm metal dowel which locates into a rubber ring on the bottom of the prime trough.

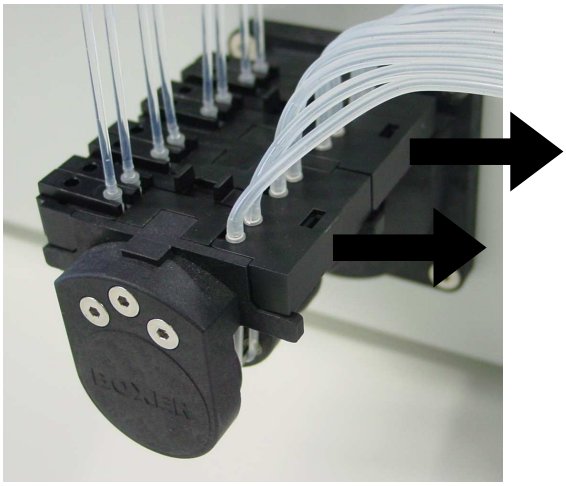


3.C The peristaltic pump

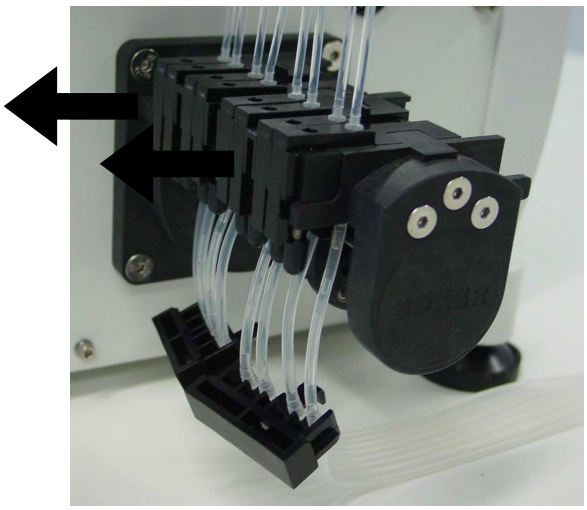
The peristaltic pump is calibrated by adjusting the 3mm hex screws on the tube clamps using a 2.5mm Allen key. Each tube can be adjusted independently allowing for greater accuracy across the width of the plate. Turn the screw anticlockwise to reduce the dispense volume and clockwise to increase the dispense volume.



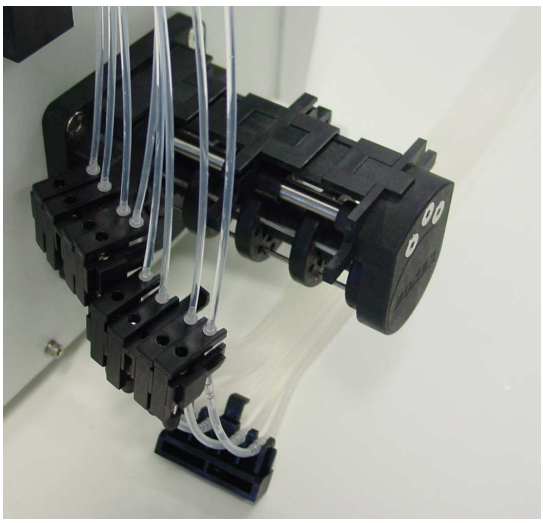
3.D Changing the peristaltic pump tubing



1. Turn off the unit. Slide out the rear tube clamps from the top of the pump.



2. Slide out the front adjustable tube clamps from the top of the pump.

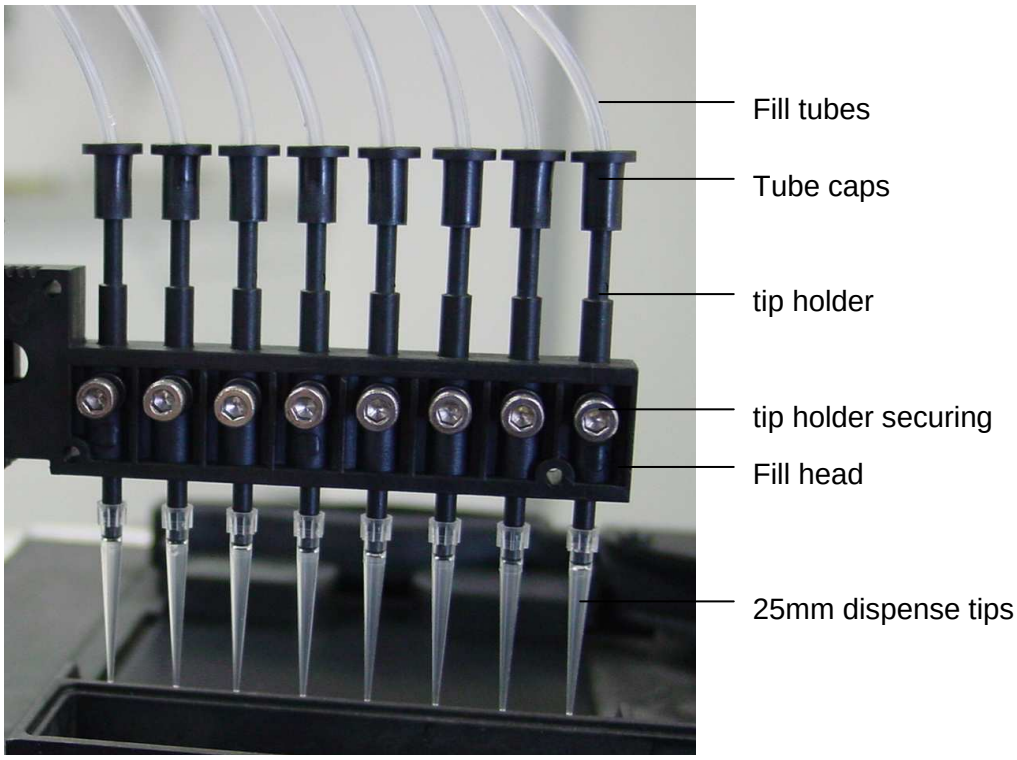


3. Unclip tube connectors from the clamps. Refit new tube and reassemble in reverse order.

3.E Fill Head assembly and alignment

The fill head should come pre assembled, if a dispense tip or tip holder is damaged the following procedure should be used to replace them.

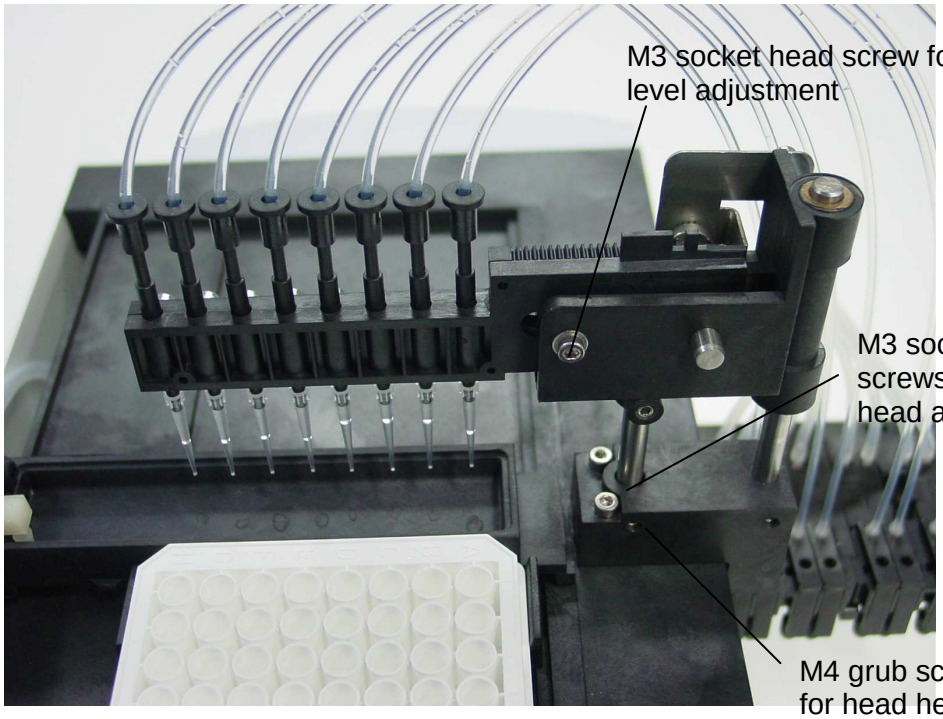
Carefully pull the dispense tips off the tip holder.
Carefully pull the tube caps up the tubes. The fill tubes can now be pulled off the tip holder.
Unscrew the tip holder securing screws from the back of the head. The tip holder can now be pulled out the top of the head.
To refit the tip holder and tips, push the tip holder into the head from the top, screw the tip holder securing screws in the back, these should only be finger tight. **Do not use an allen key to tighten**.
Make sure the tube caps are on the tubes. Push the tubes onto the tip holder, then push the tube caps over the tip holder to secure the tubes in place.
Push the tips onto the tip holder.



To give the best fill results Autura's fill head is adjusted to the correct position prior to shipping. However the size variations between plate manufacturers may necessitate the user fine-tuning this position for the type of plates most commonly used. Adjustment to the heads front to back position is achieved via the software. Head alignment within the wells is however achieved through the hardware.

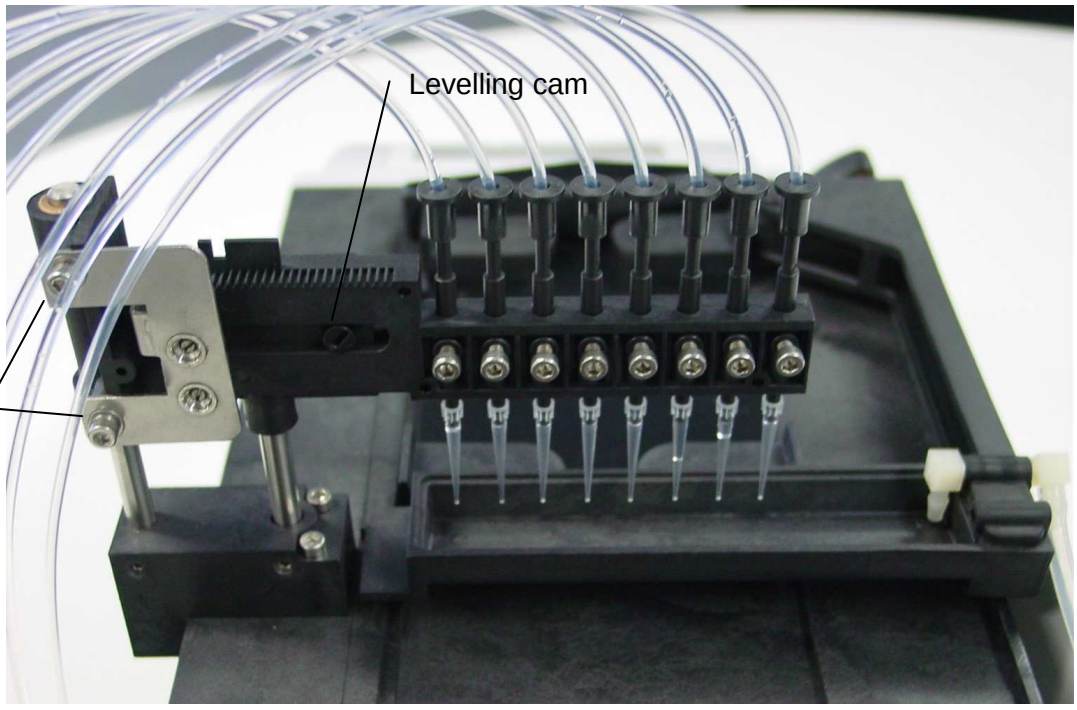
There are four adjustments to the head, which you can carry out. All hardware alignment procedures should be done with the plate you most commonly use in the plate carrier and the machine switched off.

1. Head height alignment
Move the plate with the plate carrier until its front edge is just below the first row of fill tips.
Loosen the M4 grub screw on the front of the head block, align the head so the tips are just above the edge of the plate, then retighten the grub screw.

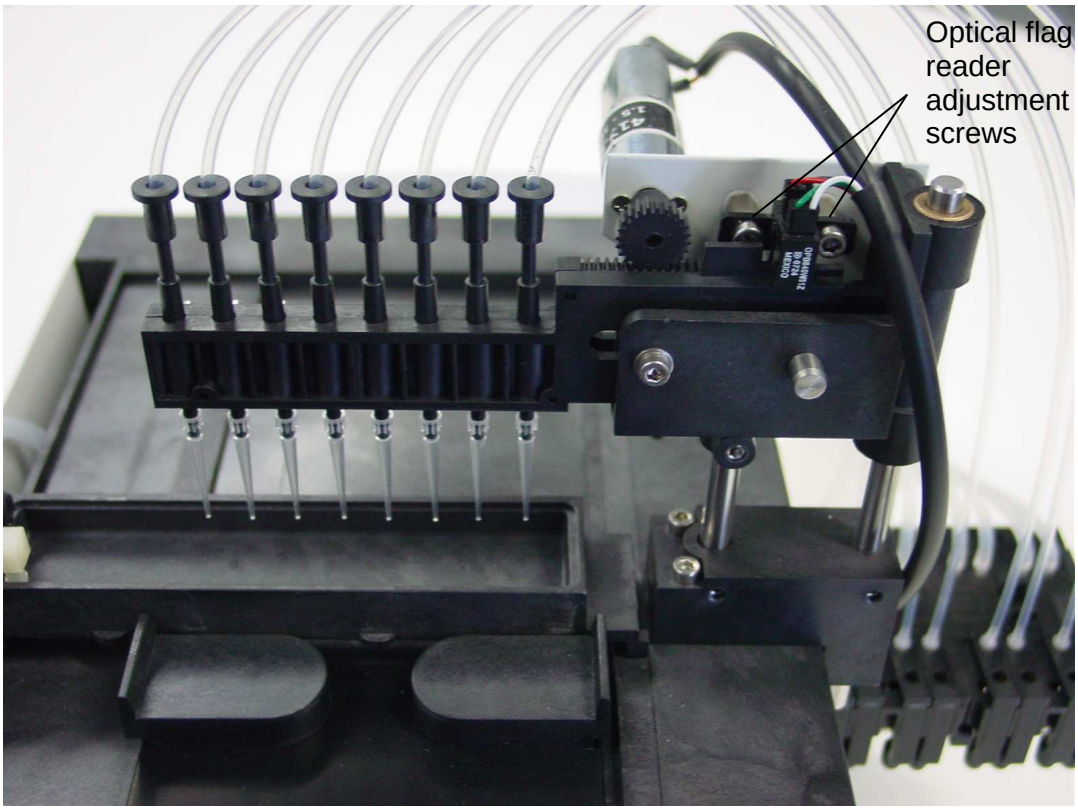

M3 socket head screw for level adjustment
M3 socket head screws for auxiliary head alignment
M4 grub screws for head height alignment

2. Auxiliary head alignment
Move the plate with the plate carrier until its front edge is just below the first row of fill tips. Check whether all the tips are in line with the edge of the plate. To remedy any misalignment, using the appropriate Allen key, loosen the 2 off M3 socket head screws on the top of the head block, align the head to the edge of the plate, and retighten the screws.

3. Level alignment
Level alignment denotes the level of the head to the horizontal plane. Move the plate with the plate carrier under the fill head. To remedy any misalignment, loosen the M3 socket head screw on the front of the fill head cradle and rotate the cam from behind using a small slotted screwdriver until the head is level. When it is level retighten the M3 socket head screw on the front.



4. Left to right alignment
Move the plate with the plate carrier under the head until the tips are aligned at the edge of the first row of wells. The head requires a realignment of its left to right axis if the tips do not align with the centre of the wells.
To remedy any misalignment, using the appropriate Allen key, loosen the two M3 socket head screws on the metal head locating bracket, move the wash head left or right for alignment, retighten the screws.



4. Left to right alignment with head motor
Move the plate with the plate carrier under the head until the tips are aligned at the edge of the first row of wells. The head requires a realignment of its left to right axis if the tips do not align with the centres of the wells.
To remedy any misalignment, lift head motor, using the appropriate Allen key, loosen the two M3 socket head screws on the optical flag reader, move the optical flag reader left or right by the same amount the head is out of alignment, retighten the screws. The Autura will need to be switched on for the motor to adjust to the new position.

4 Familiarising yourself with Autura

4.A – General

Your Autura is the most versatile strip filler currently available. Using separate exchangeable upgrade components, you can adapt your basic Autura to fill any 96 or 384 well plates with ‘V’, ‘U’ or flat bottomed wells , deep well plates (factory configured) of any possible well depth, introduce soak times between fill stages.

A strip filler by definition means that the Autura fills in a strip format. You can choose to fill any number of strips, as long as they are arranged as adjacent rows. I.e. using a single row 8 way head, you cannot choose to process rows 1 and 3 whilst skipping row 2.

The filler is designed as an open frame transparent unit in order to facilitate maintenance and upgrades as well as allowing easy integration with existing robotic systems**.**

4.B Familiarising yourself with Autura – system hardware components

For added safety Autura fillers are fitted with a remote 24v/5.4A power supply. Therefore there is no mains voltage apparent within the unit. The remote power supply plugs into your mains supply socket and should be kept away from the unit and dry at all times.

The Autura system operates by moving the microplate under the fill head.

The fluid pathways on Autura are very simple. All tubes are exposed to allow you to pin point any air bubbles that may be apparent in the tubes and to easily maintain the system.

The reagent is pumped from the reservoir via a peristaltic pump. This type of pump is used for this function so that you can optimise the delivery volume and pressure of the wash solution by adjusting the speed and rotor revolutions through the software. Peristaltic pumps pulse the liquid with every revolution of the rotor and knowingly provide a very efficient filling system.

A pump is housed in the side of the unit and produces a vacuum within the prime trough. The pump runs all the time the unit is being primed to avoid the possibility of prime trough overflow and reduce cross contamination.

Please note that the filler is fitted with a ‘prime-back’ function. This function is highlighted in the section titled ‘Aspirating the filler’ on this manual.

4.C Familiarising yourself with Autura – system software interface components

Autura stores up to 30 fill protocols in its memory. According to the machine's specification, the machine is either delivered with pre-programmed fill protocols or with a default sample protocol. In both cases you can edit the protocols with ones of choice.

The control panel is equipped with a total of seven keys.

'**soft keys'**: 'Soft keys' are keys that are assigned to carry out a certain function. These three keys are located adjacent to the bottom line of the display and its function is indicated on the display. For the purpose of clarification, soft key functions will be accompanied with *SK* in this manual.

'ENTER' key: The 'enter' key saves, in some cases, your selection from the screen into Autura's memory.

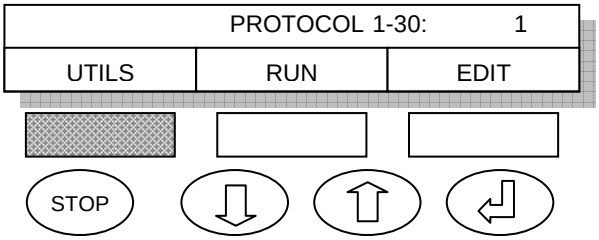
'UP' & 'DOWN' keys: These keys will either increment or decrement the values on your setting or toggle between various setting options.

'STOP' key: The 'STOP' key allows you to terminate any protocol at any time.

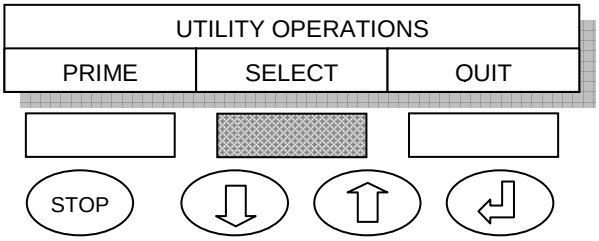
5 Utilities

5.A Priming the filler

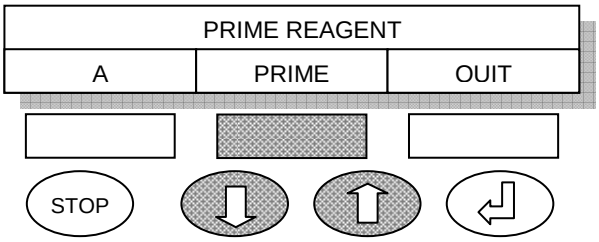
Before you start to use the filler, you should ensure that the reagent delivery tubes that lead from the reagent bottle, through the peristaltic pump, to the fill head, are primed, i.e. full with reagent and no air bubbles can be seen in the delivery tubes. For this purpose Autura has a dedicated priming utility.
The following chart will run you through all the necessary steps to prime the tubes.
You can quit the protocol editing process at any stage by pressing the 'QUIT' *SK* button.



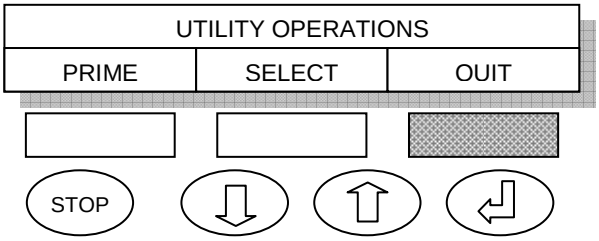
Press UTILS *SK* in order to access the utilities menu.



Press SELECT *SK* .



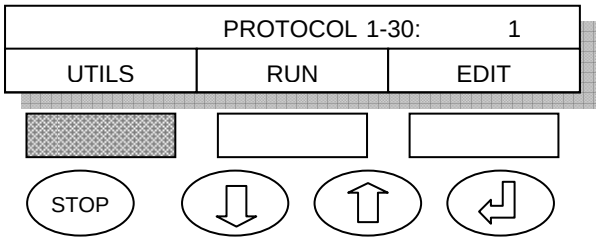
If two pumps are fitted select the pump to prime using the up/down keys.
Note: Pump A is at the back of the Autura and Pump B is at the front of the Autura.
Press PRIME *SK* to dispense a pre set volume through the tubes.
Autura will then return to the Utility Operations menu.



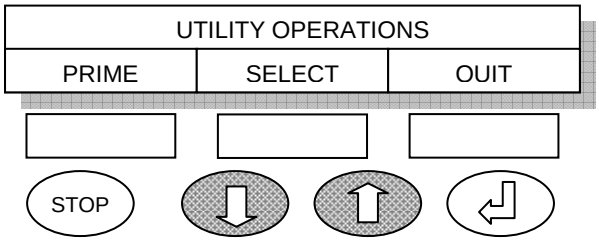
Repeat sequence as many times as is required to clear all air bubbles from the delivery tubes.Press QUIT *SK* to return to the main menu.

5.B Aspirating the filler

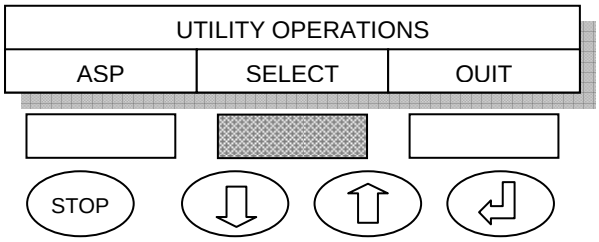
This utility allows you to aspirate the prime trough into a waste container and recover any reagent left in the tubing system.



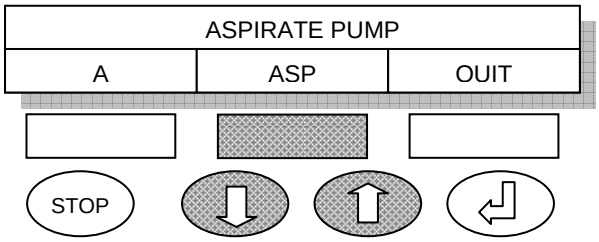
Press UTILS *SK* in order to access the utilities menu.



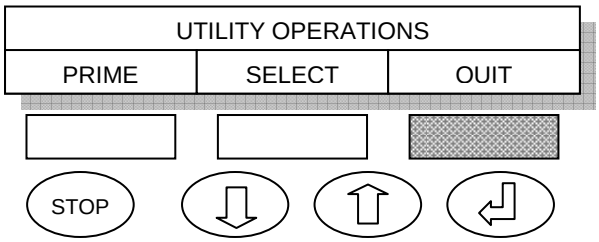
Select the Asp function by scrolling through using the up/down keys



Press SELECT *SK.*



If two pumps are fitted select the pump to aspirate using the up/down keys.
Note: Pump A is at the back of the Autura and Pump B is at the front of the Autura.
Press ASP *SK* The prime trough will be aspirated and Autura will run the peristaltic pump backwards to return any unused reagent back into the reagent bottle. Autura will then return to the Utility Operations menu.



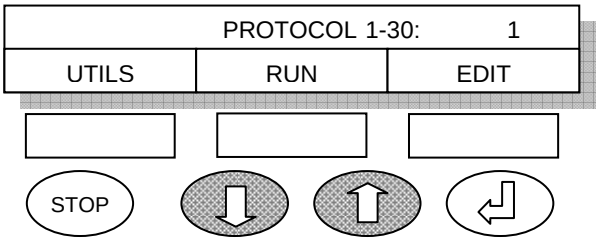
Press QUIT *SK* to return to the main menu.

6 Quick Start

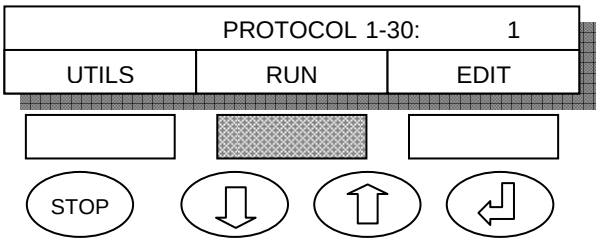
6.A Running a fill protocol

Subject to the machines specification, Autura is supplied with either a set of pre-programmed protocols, or with a single default protocol in all 30 positions.

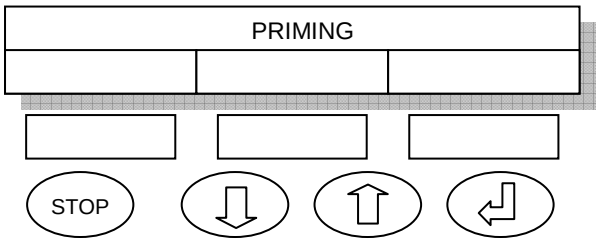
The following chart will run you through all the necessary steps to run a protocol.
You can quit the running of a protocol at any time by pressing the STOP button.



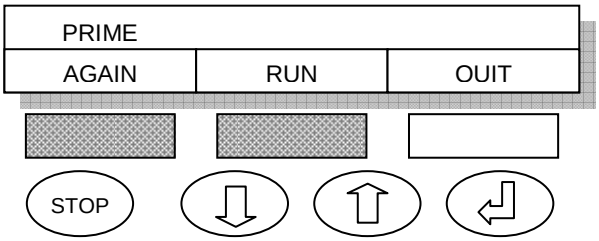
You have to determine which of the 30 protocols you would like to run. Select the desired protocol by scrolling through using the up/down keys.



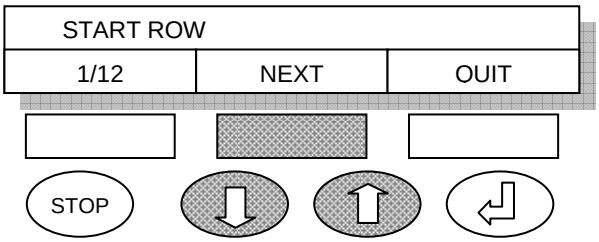
Press RUN *SK* to run a protocol



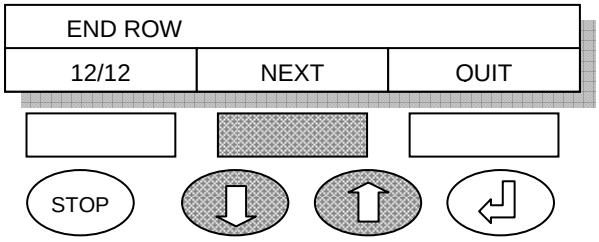
Autura starts the vacuum pump in order to empty the prime trough.
First time it will initiate a self-priming cycle before it runs.



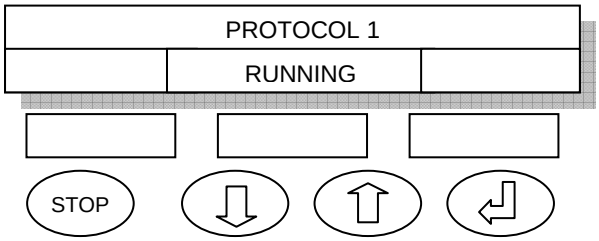
If you can still see air bubbles in the delivery tube, you can prime again by pressing the PRIME AGAIN *SK*, or press RUN *SK*.



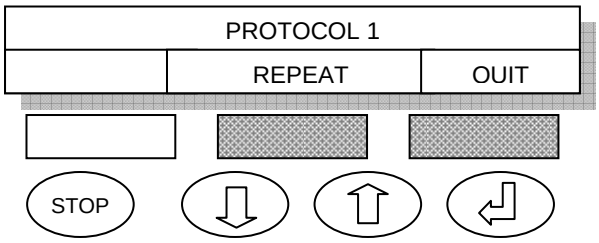
Choose the row you want to start from by scrolling through using the up/down keys. Then press NEXT *SK*.



Choose the row you want to end on by scrolling through using the up/down keys. Then press NEXT *SK*.



Autura runs the selected fill protocol for the number of rows you have selected. You can stop the process by pressing the STOP button on the control panel.



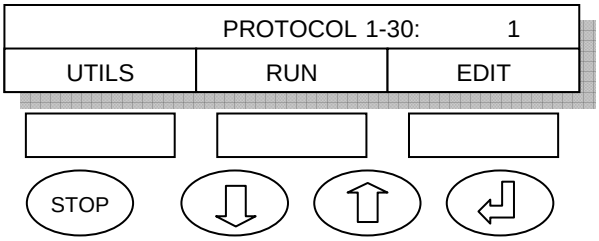
Press REPEAT *SK* to repeat protocol or QUIT *SK* to return to main menu.

7 Navigating through the control panel

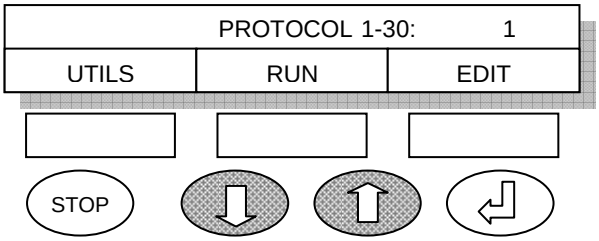
7.A Editing fill protocols

The following chart will run you through all the necessary steps to edit a protocol.
You can quit the protocol editing process at any stage by pressing the 'QUIT' *SK* button. Always press the 'STORE' *SK* button to enter your selection into Autura's memory and move to the next screen. Press 'STORE' *SK* in order to move to the next screen even if you do not change any values. Use the edit function to review the settings of any protocol stored.

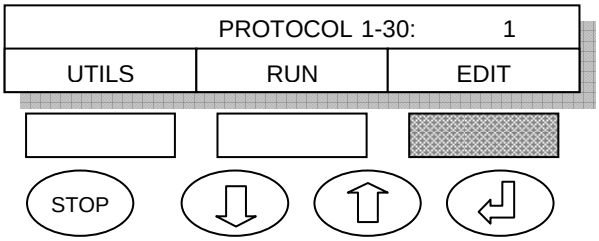
NOTE: If you quit a screen at any stage of the editing, none of the changes you have made will be saved. In order to save any of your changes to a protocol, you must scroll to the last screen that asks you to overwrite or change the protocol position you want to change.



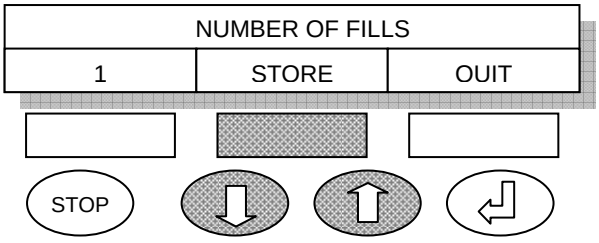
The 'EDIT' *SK* will allow you to edit any one of 30 protocols. You assign the position of the edited protocol when you overwrite it. The following chart will run you through all the necessary steps.



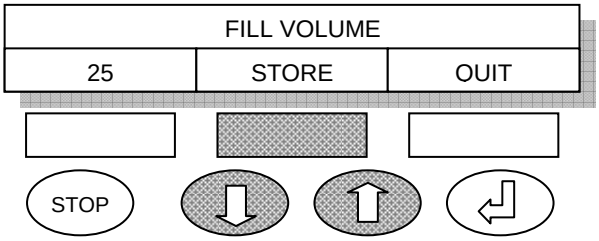
Choose a protocol to edit by scrolling through using the up/down keys.



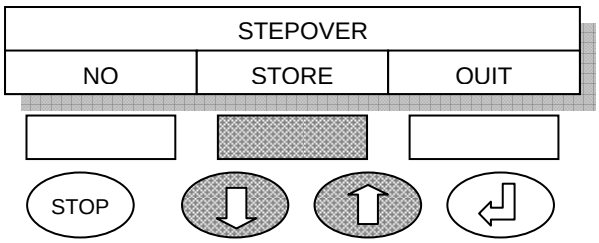
Press EDIT *SK*.



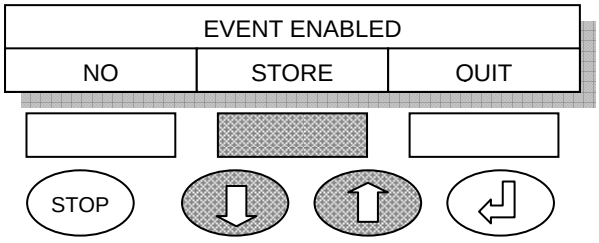
Use the up/down keys, enter the number of fill cycles. A fill cycle is defined as the number of times that the fill head will fill the row of wells. Press STORE *SK* to scroll through to the next menu.



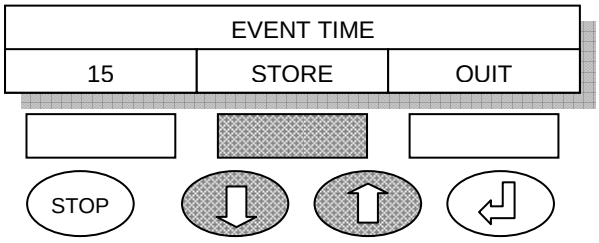
Use the up/down keys, select the desired fill volume per well. The volume is expressed in micro litres per well. Press STORE *SK* to scroll through to the next menu.



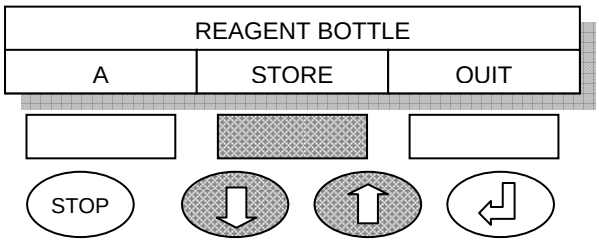
This menu will only appear if you have 96 well plate selected.
Use the up/down keys to toggle between 'YES' & 'NO'. The step over function will determine whether Autura will process the plate as if all rows are filled regardless of the number of rows to be filled. Press STORE *SK* to scroll through to the next menu.



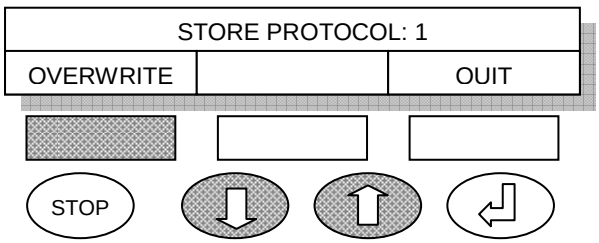
Use the up/down keys to toggle between 'YES' & 'NO'. The event enable function allows for a plate soak time after each fill cycle. Only one event can be assigned for any particular protocol. Press STORE *SK* to scroll through to the next menu.



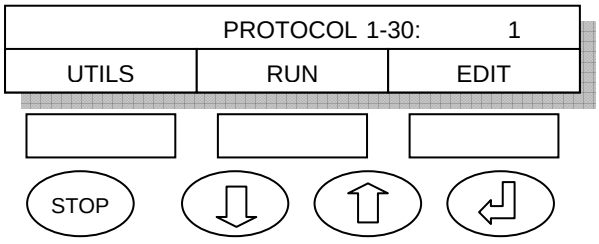
This menu will not appear if you chose N0 in the previous menu, i.e. no event. In this menu you can assign the duration of the event.
Using the up/down keys, the event duration will increment from 15 to max 900 seconds in steps of 15 seconds.
For example if you choose 120 this means a soak time of 2 minutes. If you previously chose three fills, the filler will fill the rows with reagent and move the plate to the designated event position after each cycle for a period of 2 minutes, before moving it back under the fill head for the next fill cycle.
Press STORE *SK* to scroll through to the next menu.



This menu will only appear if you have two pumps fitted.
Using the up/down keys, select reagent bottle to use.
Note: Pump A is at the back of the Autura and Pump B is at the front of the Autura.
Press STORE *SK* to scroll through to the next menu.



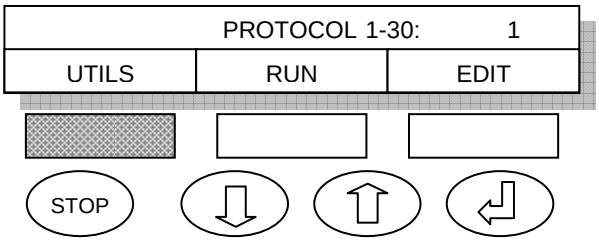
Store the protocol that you have just edited in any of the 30 positions. The up/down keys will step you from position to position. The OVERWRITE *SK* will store the new protocol.
NOTE: Storing a protocol in a particular position overwrites the protocol, which was previously in that position.



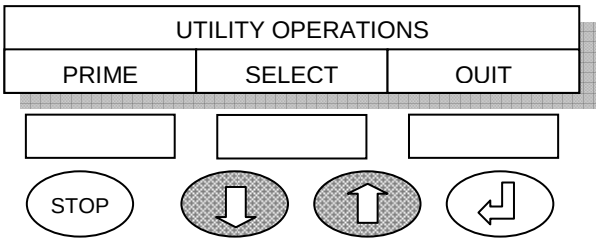
Following the storage of a protocol, Autura will return to display the main menu.

7.B Chaining protocols

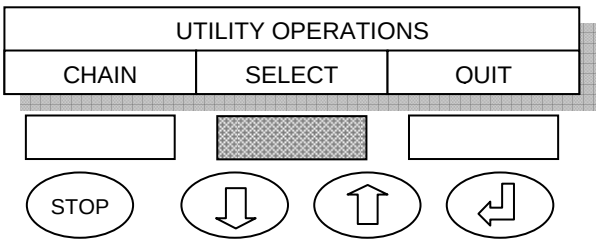
A simple way to achieve complex fill sequences is to chain together various protocols. If chaining is enabled you can chain together up to four protocols. Autura will run each chain as a single protocol characterised by your setting for each of the individual protocols according to any sequence you desire. You can create up to 5 different chains.



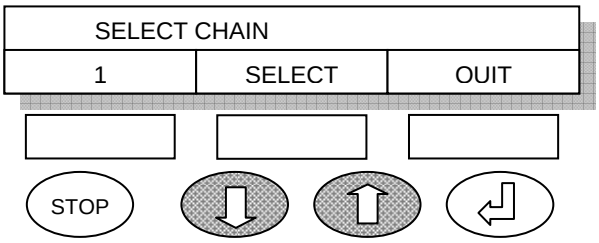
Press UTILS *SK* in order to access the utilities menu.



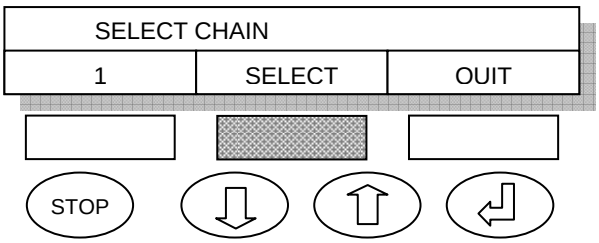
Select the Chain function by scrolling through using the up/down keys



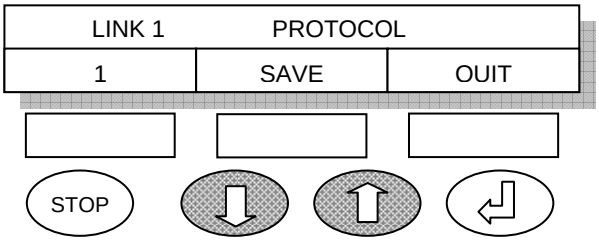
Press SELECT *SK.* In order to access the chaining menu.



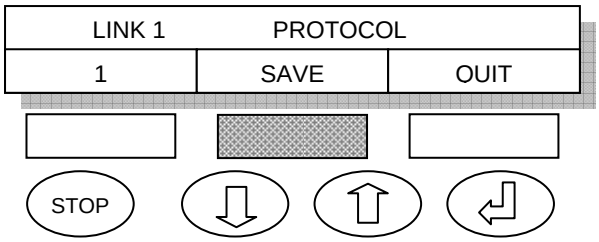
Select the Chain to be edited by scrolling through using the up/down keys



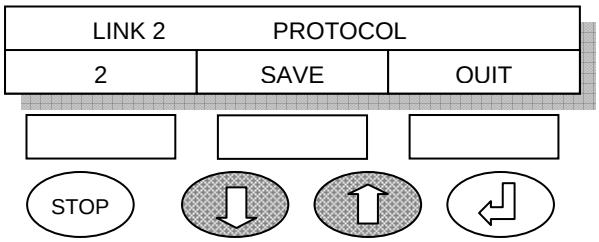
Press SELECT *SK.* In order to access the chain editing menu.



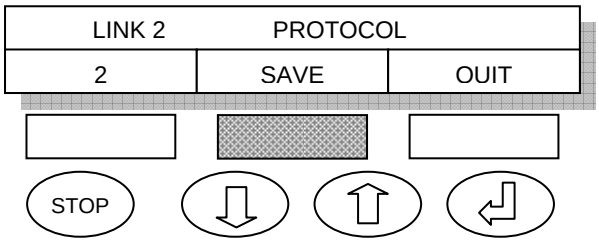
Select the first Protocol to be chained by scrolling through using the up/down keys



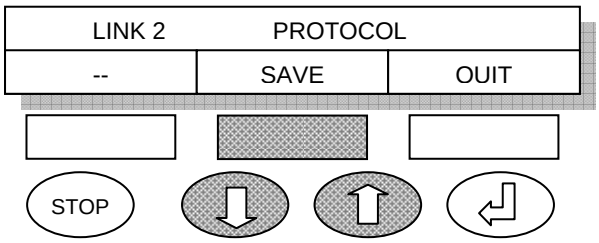
Press SAVE SK. To move to the next link menu



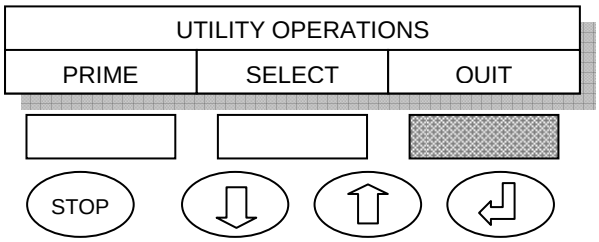
Select the second Protocol to be chained by scrolling through using the up/down keys



Press SAVE SK. To move to the next link menu

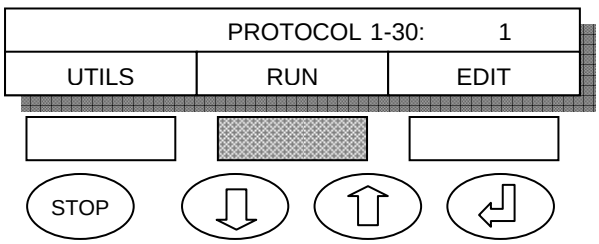


Repeat the above steps to chain more Protocols. If you don't want to chain anymore Protocols use the up/down keys to select --. Press SAVE SK. To move to the next link menu
When all 4 links are saved it will return to the utilities menu.

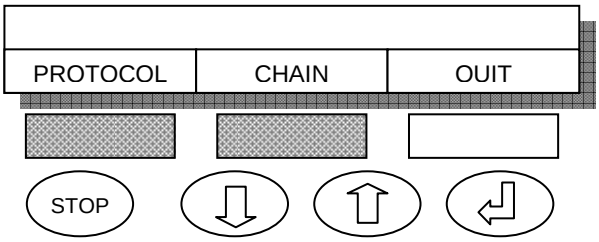


Press QUIT *SK* to return to the main menu.

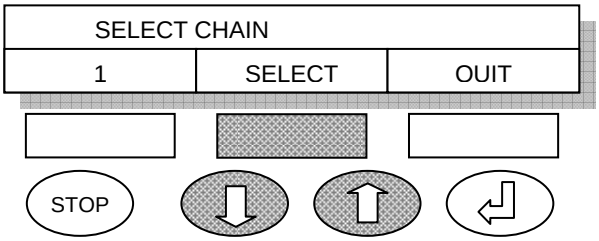
When chaining is enabled the run menu will change.
The following chart will run you through all the necessary steps to run a chain or a protocol.
You can quit the running of a chain or a protocol at any time by pressing the STOP button.



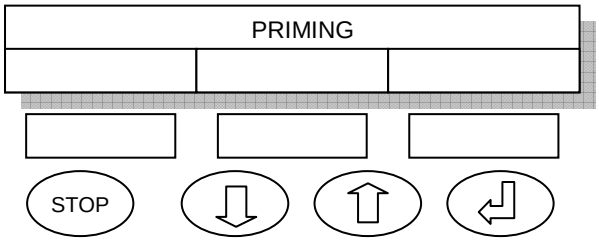
Press RUN *SK* to run a chain or a protocol.



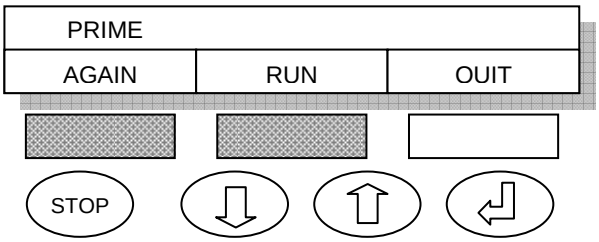
Press PROTOCOL *SK* to run the current protocol as normal or press CHAIN *SK* to select a chain to run.



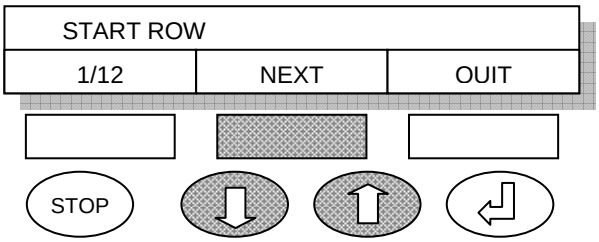
If you selected chain this menu will appear. Select the chain you want to run by using the up/down keys. Press SELECT *SK.* To run the chain.



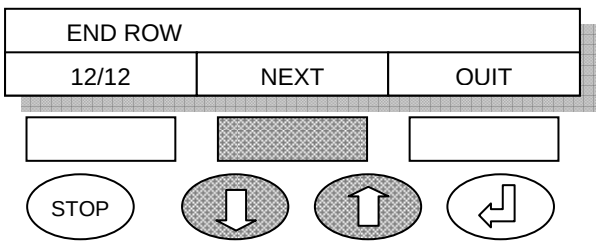
Autura starts the vacuum pump in order to build up the required vacuum in the waste bottle. First time it will initiate a self-priming cycle before it runs.



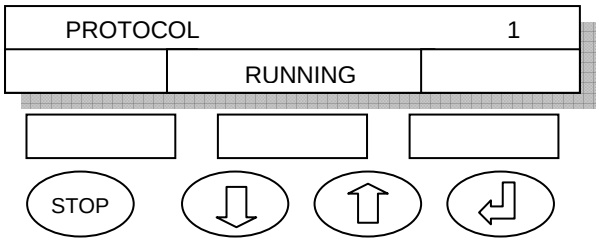
If you can still see air bubbles in the delivery tube, you can prime again by pressing the PRIME AGAIN *SK*, or press RUN *SK*.



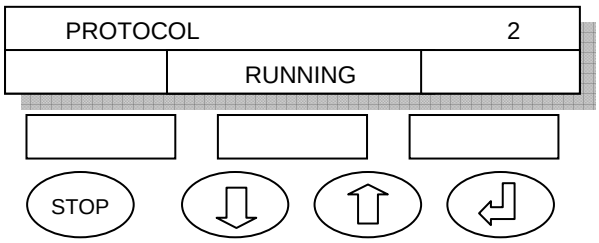
Choose the row you want to start from by scrolling through using the up/down keys. Then press NEXT *SK*.



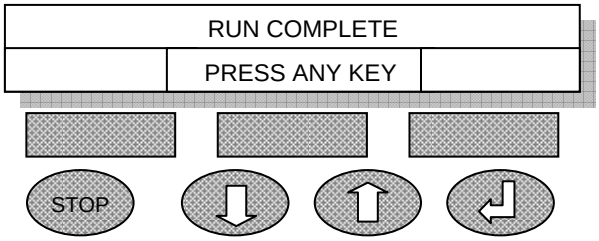
Choose the row you want to end on by scrolling through using the up/down keys. Then press NEXT *SK*.



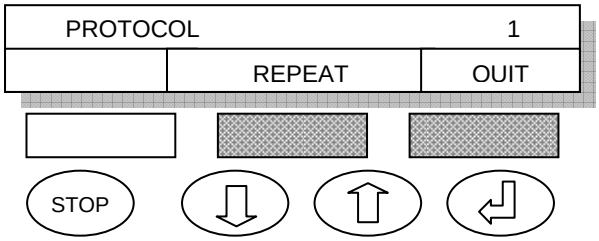
Autura runs the selected fill protocol for the number of rows you have selected. You can stop the process by pressing the STOP button on the control panel.



If you selected chain it will automatically move onto the next protocol in the chain.



Autura confirms that the fill cycle is complete. This message is to assure you that the cycle was not terminated prematurely.
Press any key to confirm.

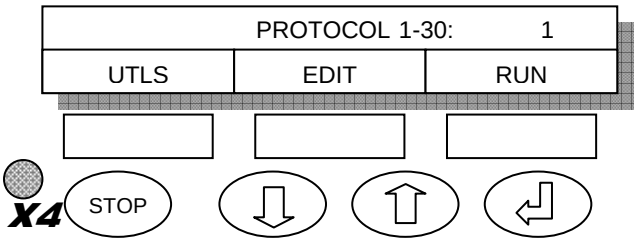


Press REPEAT *SK* to repeat protocol or chain.
Press QUIT *SK* to return to main menu.

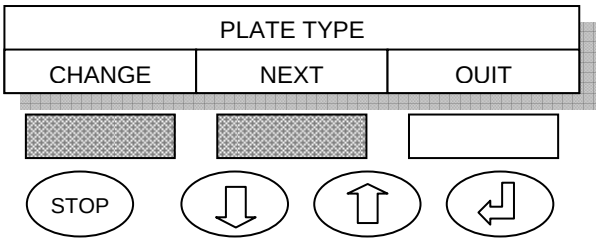
7.C Engineering menu

This menu should only be used by the principle laboratory operator and is dedicated to changing various software configurations such as changing the machine from 8 to 12 way wash head use and the fine positional of the plate – head geometry. You can scroll through the menus by pressing the NEXT *SK* button. Changes made to any of the menus will be automatically entered into the machines memory. You can quit at any point.

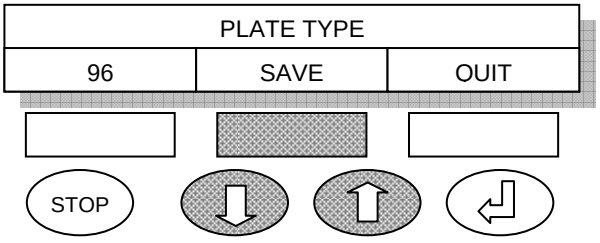
In order to inhibit unauthorised personnel from making changes to the settings, the access to this set of menus is via a hidden key.



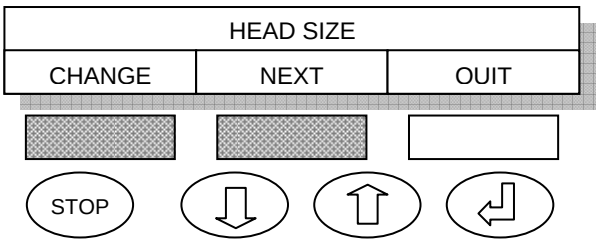
The hidden key is positioned to the left of the keypad between the two rows of keys. Press the hidden key four times to access the engineering menu.



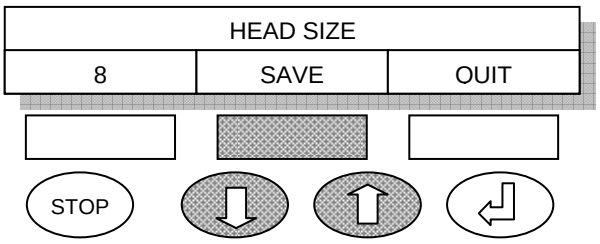
This menu will only appear if the head motor has been enabled (factory option).Press CHANGE *SK* to enter this procedure or NEXT *SK* to scroll through to the next menu.



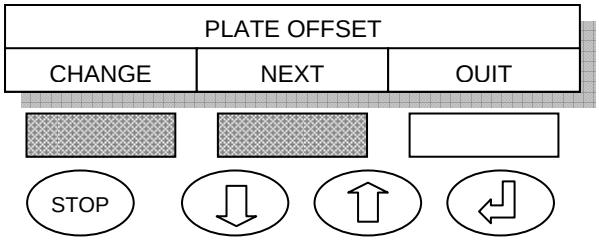
Use the up/down keys to toggle between 96 and 384.Press SAVE *SK* to scroll through to the next menu.



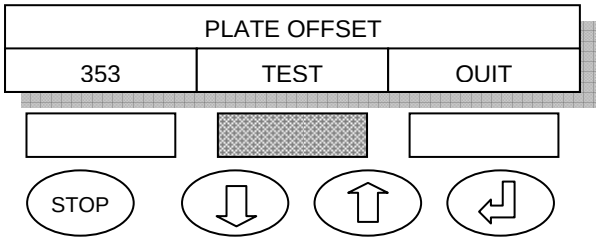
Press CHANGE *SK* to enter this procedure or NEXT *SK* to scroll through to the next menu.



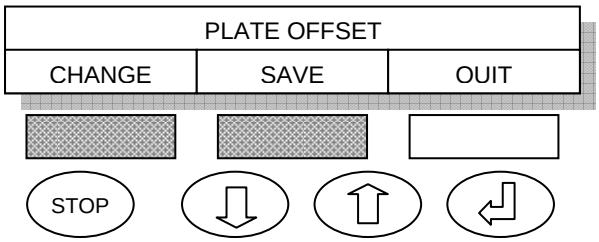
Use the up/down keys to toggle between 8, 12, 8 X 2 and 12 x 2.Press SAVE *SK* to scroll through to the next menu.



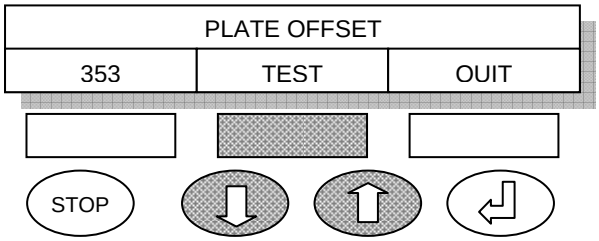
This menu is designed to allow the front to back alignment of the wash tips in the wells. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



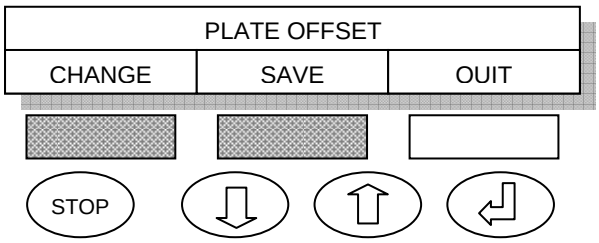
Press TEST *SK* the plate will move under the head. Check whether the head alignment is centralised over the first row of wells.
Note: If the Autura is fitted with 2 heads set the offset for the back head.



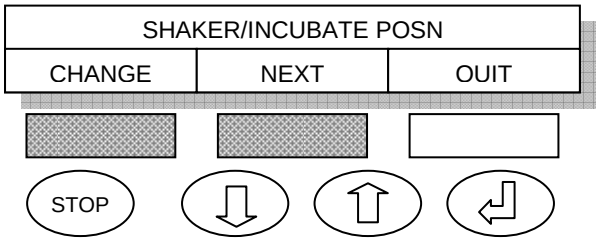
If head is aligned central over the first row of wells press SAVE *SK* to scroll through to the next menu. If the head is not aligned press CHANGE *SK*



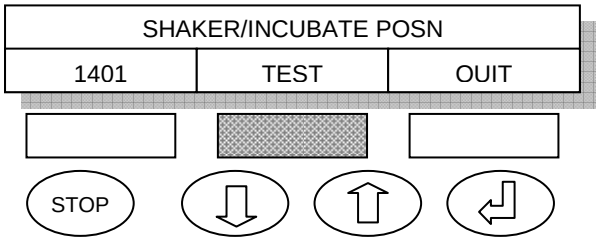
Use the up/down keys to step the plate under the head. Press TEST *SK* to check whether the head alignment is centralised over the first row of wells.
Note: The numbers refer to steps approx 22 steps per 1mm. The position 0 is to the front of the washer. Increment the number in order to move the plate backwards. Decrement the number if you wish the plate to move towards you.



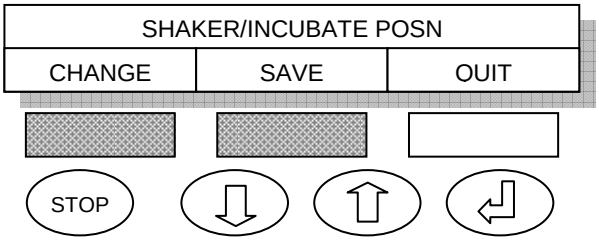
If head is aligned central over the first row of wells press SAVE *SK* to scroll through to the next menu. If the head is not aligned press CHANGE *SK* and repeat above steps.



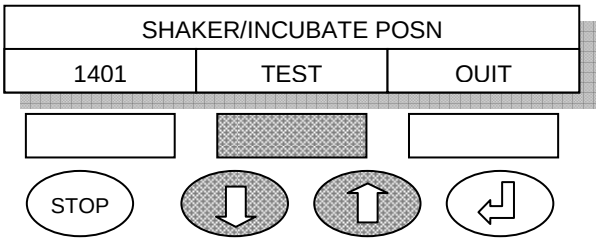
This menu is designed to allow the front to back alignment of the plate in the shaker or incubate position. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



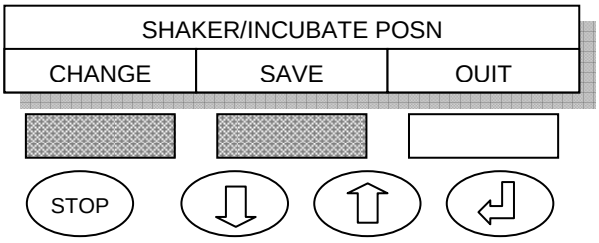
Press TEST *SK* the plate will move into position. Check whether the plate alignment is centralised over the shaker or incubate position.



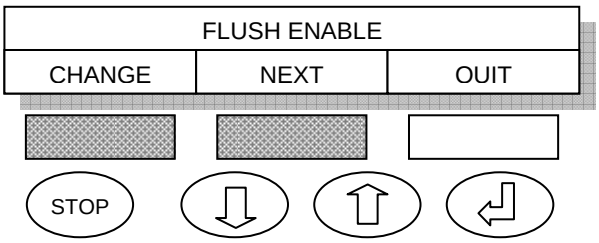
If plate is aligned central over the shaker or incubate position press SAVE *SK* to scroll through to the next menu. If the plate is not aligned press CHANGE *SK*.



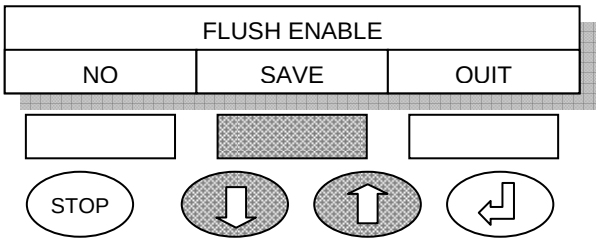
Use the up/down keys to step the plate over the shaker or incubate position. Press TEST *SK* to check whether the plate alignment is centralised over the shaker or incubate position.
Note: The numbers refer to steps approx 22 steps per 1mm. The position 0 is to the front of the washer. Increment the number in order to move the plate backwards. Decrement the number if you wish the plate to move towards you.



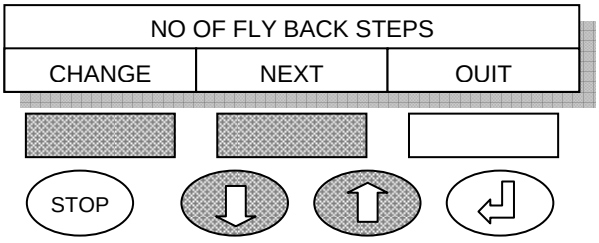
If the plate is aligned press SAVE *SK* to scroll through to the next menu. If the head is not aligned press CHANGE *SK* and repeat above steps.



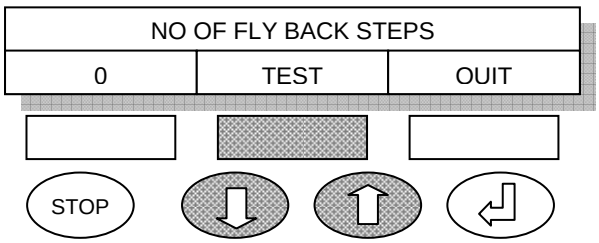
Press CHANGE *SK* to enable flushing or NEXT *SK* to scroll through to the next menu.
Note: Flushing can only be done if a second peristaltic pump is fitted.



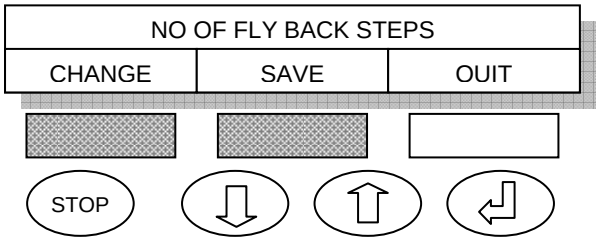
Use the up/down keys to toggle between ‘YES’ or ‘NO’. Press SAVE *SK* to scroll through to the next menu.



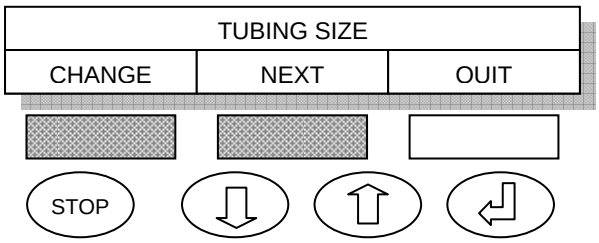
This sets the number of reverse steps of the peristaltic pump after a dispense. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



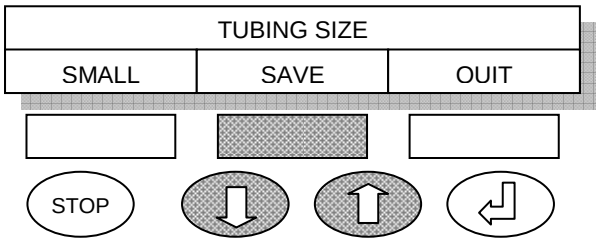
Use the up/down keys to change the number of steps. Each key action increments the number of steps by a factor of 1, 255 is the maximum number of steps. Press TEST *SK*



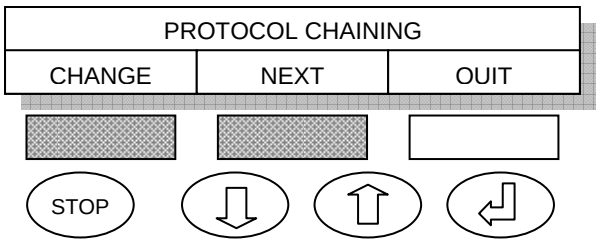
If the number of steps is correct press SAVE *SK* to scroll through to the next menu. If the number of steps is not correct press CHANGE *SK* and repeat above steps.



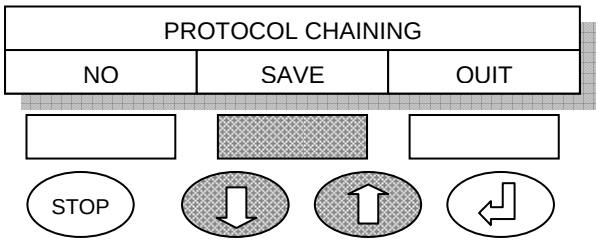
Press CHANGE *SK* to change the size of tubing fitted to the peri pump or NEXT *SK* to scroll through to the next menu.



Use the up/down keys to toggle between ‘Small’, ’Medium’ or ‘Large’. Press SAVE *SK* to scroll through to the next menu.



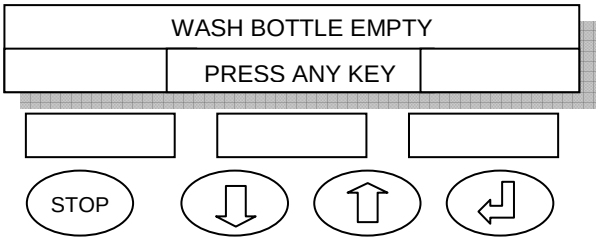
Press CHANGE *SK* to enable protocol chaining or NEXT *SK* to scroll through to the next menu.



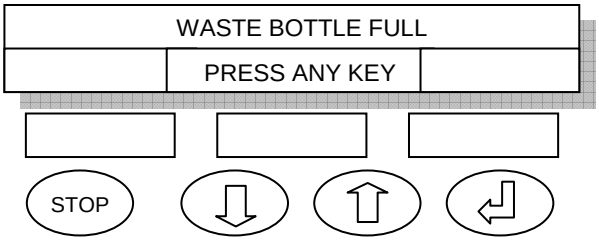
Use the up/down keys to toggle between ‘No’ or ‘Yes’. Press SAVE *SK* to scroll through to the next menu.

8 Error messages

The error messages are there to inform you if a situation occurs that is detrimental to the smooth operation of the unit. Take the necessary steps before attempting to continue the work.



To fill the wash bottle or to empty the waste bottle first unscrew the caps and lift the sensing floats vertically from the bottles and lay on a tissue paper to drain. Empty or fill the bottles.



9 Maintenance routine

These instructions are intended as a daily routine that will help you to keep the equipment fit for a long operational life.

Safety first: Always wear disposable gloves, safety goggles and a laboratory coat before performing any maintenance.

9.A At the end of a working day:

10.1. Do not leave the fill head to dry out between runs. As some reagents could block up the tips.

10.2. Fill the reagent bottle with distilled water and flush all the delivery tubes and the head thoroughly by priming the system until the distilled water is dispensed through the fill head.

10.3. Empty the waste reservoir and rinse them thoroughly with distilled water. Saline solution that might crystallise on the level detection float will stop the system from working properly. Remove the level detection rods from both bottles and let them dry on a tissue paper (If fitted).

10.4. Any dispense tubes that become blocked can be cleaned using the cleaning probe supplied as part of the accessory kit.

10.5. It is advised that the pressure is removed from the peristaltic pump tubes, to do this remove the tube clips on the pump.

10.6. Dry out any liquid residues from the prime trough with tissue paper.

9.B At the beginning of a working day:

10.7. Check that the fill head is in perfect condition and none of the tubes are bent, damaged or blocked.

10.8. Check that the floats move freely on the level detection rods and reassemble the level detection system onto the waste & wash bottles (If fitted).

10.9. Reassemble the peristaltic tubes into the pump.

10.10. Fill the reagent reservoir and prime reagent into the prime trough.

10 Trouble shooting

The following guide is aimed to help you to address operational problems of the equipment. Please contact our qualified service engineer if the fault continues to exist after you have completed these checks.

Problem	Possible Cause	Possible Remedy
1. Display & Power LED do not illuminate	▪ No power to the unit	▪ Replace the fuse and check power connection is well inserted into the socket. Check the LED is illuminated on remote power supply.
2. 'Waste Bottle Full'/'Reagent Bottle Empty' message although OK	▪ Level detection DIN plug not properly plugged into sockets ▪ Floats on level sensing rods not moving freely	▪ Check level detection connectors ▪ Clean level sensing rods
3. Dripping dispense tubes	▪ Pump speed too low ▪ Blocked dispense tubes ▪ Pump tubes not properly inserted in peristaltic pump	▪ Increase pump speed ▪ Unblock tubes with unclogging needle ▪ Open pump clip and reassemble tubes
4. Reagent spilling over prime trough	▪ Vacuum pump malfunction ▪ Blocked aspirate tube	▪ Check pipes and connectors between waste bottle and prime trough.

11 Sending back for maintenance or repair

Please do not send the equipment back for repair or maintenance until you have agreed the procedure with Mikura Ltd. or your distributor. You will receive a Return Authorisation Number (RAN) once you have agreed that the instrument must be returned.

Units will only be accepted for repair if accompanied with a fully completed and signed Return & Decontamination Certificate. A copy of the certificate is attached to this manual. Units, which are not accompanied with the certificate, will not be accepted into the factory and returned at your expense.

Note: The equipment can be returned only after the following decontamination procedure has been completed.

Safety first: Always wear disposable gloves, safety goggles and a laboratory coat before performing any decontamination routine.

1. Empty the waste bottle completely
2. Fill the reagent bottle with at least 200ml 10% Chlorine bleach solution and prime the system thoroughly.
3. Disassemble fill head and immerse in 10% bleach solution for 2 hours.
4. Flush waste and wash bottles with 10% bleach solution
5. Wet a cleaning pad with bleach solution and clean all outside surfaces of the equipment and bottles
6. Pack the unit in its original packaging. Mikura Ltd. is not liable for any damage incurred in transport if the original packaging is not used.

Return & Decontamination Certificate

mikura

Mikura Limited
Spinningwood Farm
Burnthouse Lane
Lower Beeding
W Sussex
RH13 6NN
United Kingdom
☎ 44 (0) 1403 891875
🖷 44 (0) 1403 892651
info@mikura.co.uk

RAN number ☐☐☐☐☐☐☐
Serial Number ☐☐☐☐☐☐☐

Name

_____

Laboratory name

_____

Full address:
Street

_____

Town

_____

ZIP

_____

Tel. No.

_____

Fax No.

_____

Email

_____

Laboratory supervisor

Describe nature of fault:

Is the equipment's surface or components damaged in any other way?

The equipment has been in contact through use or otherwise with the following media:

- ☐ Body fluids
- ☐ Toxic media
- ☐ Carcinogenic media
- ☐ Radioactive media
- ☐ Other hazardous materials
  Please specify:
  _____

I hereby certify that the enclosed equipment has been fully decontaminated as per the instruction in the Autura Manual.

To the best of my knowledge, service personnel can handle the equipment without exposing them to health hazards.

Signed _____

Print name _____

Date _____

12 Materials compatibility chart

Component	Material	Acetone	Ethanol (EthylAlcohol)	Dimethylformamide (DMF)
Delivery tubes	FEP (Fluorinated ethylene propylene)	R	R	R
Peristaltic pump tubes	Silicone	L	R	R
Level sensing tubes/Tube fittings	PP	R	R	R
	Acetal (Polyoxymethylene) Delrin Du-Pont	R	R	R
Reagent bottles	PC	X	R	X
Bottle tops	ABS (Acrylonitrile Butadiene Styrene)	X	R/L	X
Head lifting rods/Screws	Stainless Steel	R	R	R
Dispense head	PPS Ryton (polyphenylene sulfide)	R	R	R
Plate carrier/Top plate	PPS Ryton (polyphenylene sulfide)	R	R	R
Front and back mouldings	ABS (Acrylonitrile Butadiene Styrene)	X	R/L	X

X = Not Recommended
L = Limited
R = Recommended

13 General Specification

Dimensions - main unit:	230mm(W) X 485mm(D) X 275mm(H)
Weight – complete system:	6.5Kg
Operating voltage:	100-240Vac 50/60Hz
Power consumption:	129.6VA
Power Supply	24V 5.4A DC Switch Mode, centre +
Environmental operating temperature:	10 ºC – 40 ºC
Environmental storage temperature:	4 ºC – 40 ºC
Precision @ 350µl	CV =± 3%@300µl
Dispensing volume	12.5 -400µl in 12.5µl increments

Protocols:	
Max number of protocols	30
Min fill volume	5µl
Max fill volume	1500µl
Min soak time	1 seconds
Max soak time	15 minutes

CE

The CE sign certifies that the instrument meets the requirement of the EEC directive and has been tested according to the specified test methods.

WEEE COMPLIANCE

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Mikura Ltd has contracted with one or more recycling/disposal companies and this product should be disposed of or recycled through them. Further information on Mikura Ltd's compliance with these Directives, the recyclers, and information on Mikura Ltd products which may assist the detection of substances subject tothe RoHS Directive are available on request.

Produced by

Mikura Ltd.
Spinningwood Farm
Burnthouse Lane
Lower Beeding
W Sussex
RH13 6NN
England

It is the stated philosophy of Mikura Ltd to preserve the environment wherever possible.

Mikura will only use materials and production techniques that cause least environmental damage.

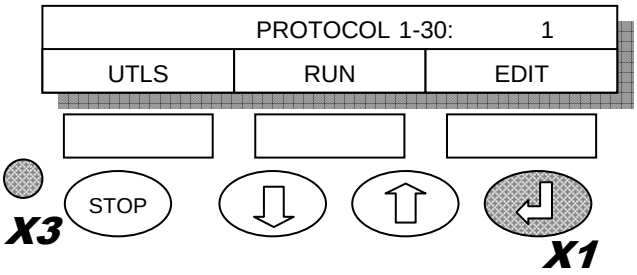
List of Protocols

No.	Number of fills	Fill volume	Stepover	Event enabled	Event type	Event time	Reagent bottle
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

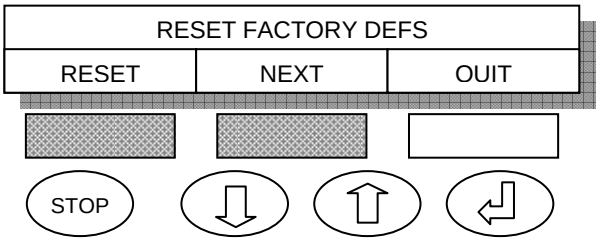
14 Appendix A - Service Engineer Menus

This appendix is for routines that are intended for the service engineer only. Most menus are identical to user engineering menu. There are however some additional menus that allow fine adjustment and return to factory default settings.

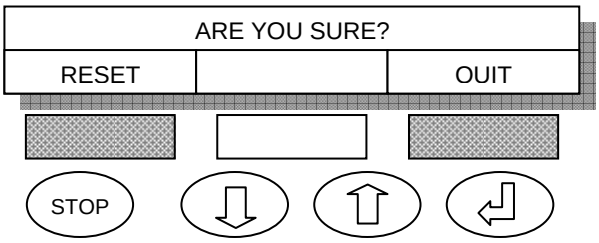
The following instructions focus on the menus that are in addition to the normal user engineering menus.



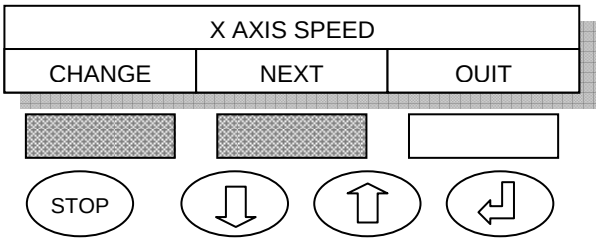
To access the service engineer menu, press the hidden key three times and than the ↵ key once.



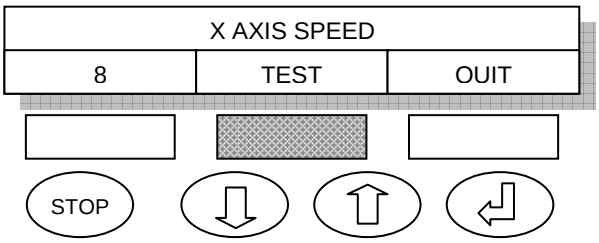
RESET FACTORY DEFS command sets all the protocols and engineering settings to the factory's default settings. The user will loose all the custom written protocols.
Press RESET *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



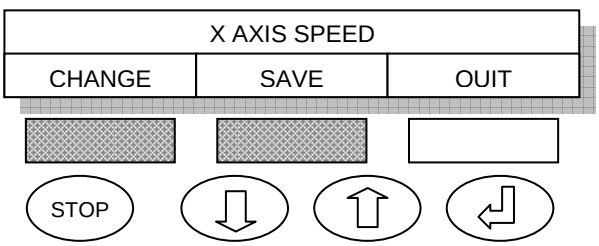
DO NOT PRESS RESET UNLESS YOU ARE ABSOLUTLY SURE
Press QUIT *SK* to scroll through to the next menu.



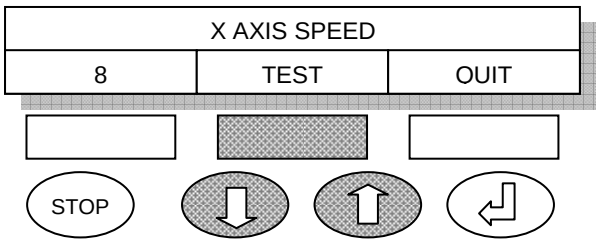
X AXIS SPEED is the speed in which the plate carrier moves along the front to back axis. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



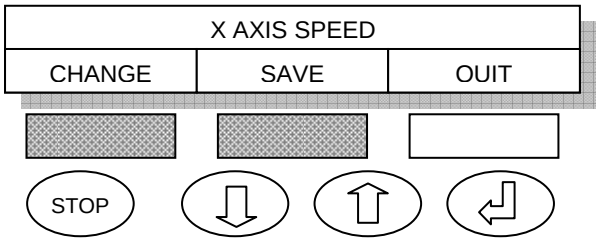
Press TEST *SK* the plate carrier will move back and forwards. Check whether the speed is correct.



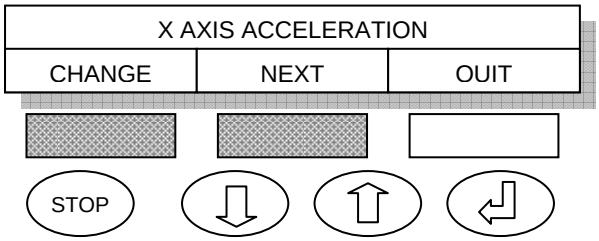
If plate speed is correct press SAVE *SK* to scroll through to the next menu. If the plate speed is not correct press CHANGE *SK*.



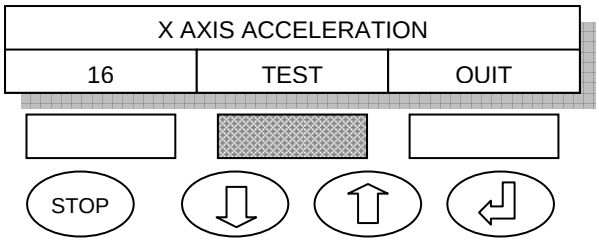
Use the up/down keys to change the speed. Press TEST *SK* to check whether the plate speed is correct.



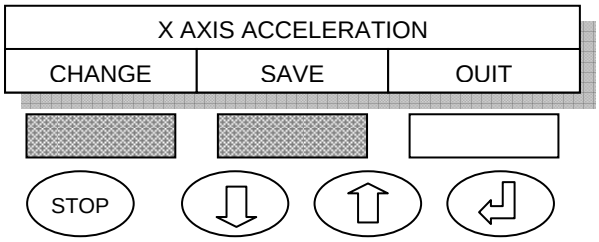
If plate speed is correct press SAVE *SK* to scroll through to the next menu. If the plate speed is not correct press CHANGE *SK* and repeat above steps.



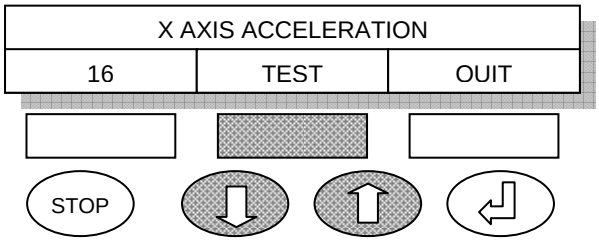
X AXIS ACCELERATION is the acceleration in which the plate carrier moves along the front to back axis. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



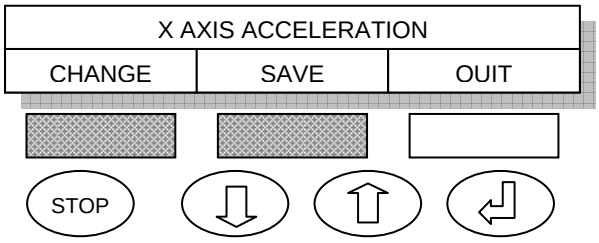
Press TEST *SK* the plate carrier will move back and forwards. Check whether the acceleration is correct.



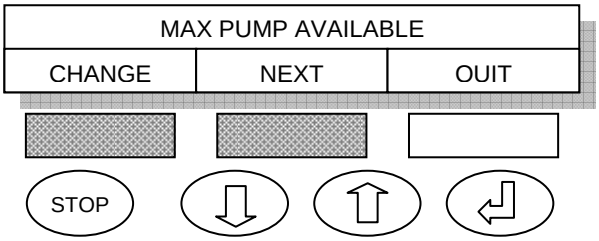
If plate acceleration is correct press SAVE *SK* to scroll through to the next menu. If the plate acceleration is not correct press CHANGE *SK*.



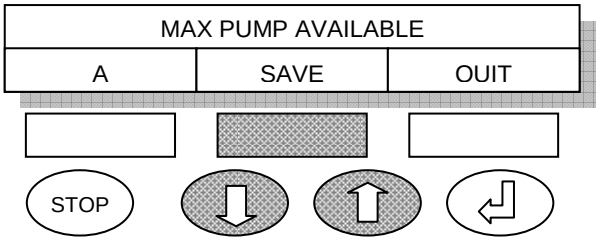
Use the up/down keys to change the acceleration. Press TEST *SK* to check whether the plate acceleration is correct.



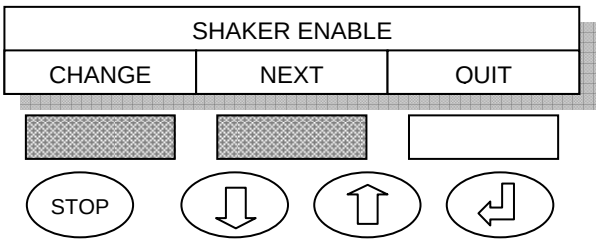
If plate acceleration is correct press SAVE *SK* to scroll through to the next menu. If the plate acceleration is not correct press CHANGE *SK* and repeat above steps.



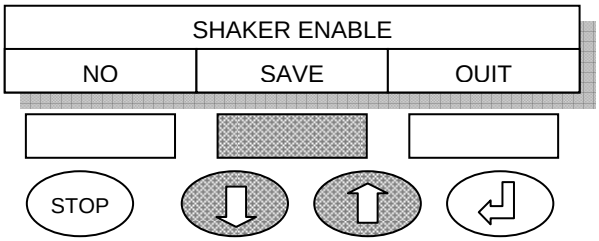
Press CHANGE *SK* to change the number of pumps or NEXT *SK* to scroll through to the next menu.



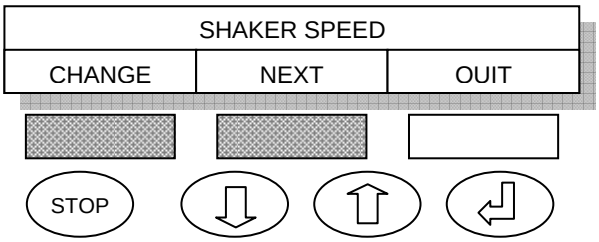
Use the up/down keys to toggle between ‘A’, ‘B’ or ‘C’ Press SAVE *SK* to scroll through to the next menu.



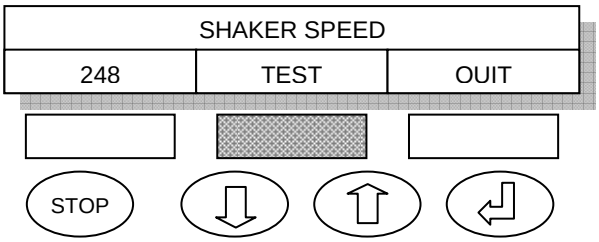
Press CHANGE *SK* to enable the shaker, if fitted or NEXT *SK* to scroll through to the next menu.



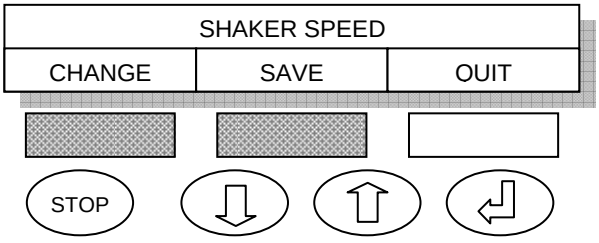
Use the up/down keys to toggle between ‘YES’ or ‘NO’ Press SAVE *SK* to scroll through to the next menu.



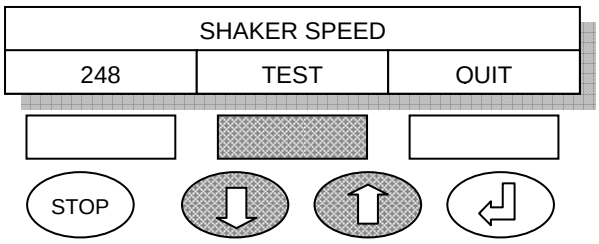
This menu will not appear if you chose N0 in the previous menu, i.e. no shaker. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



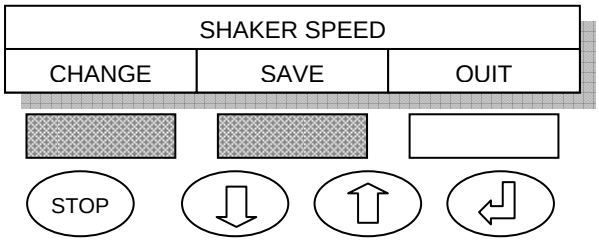
Press TEST *SK* the plate will move into the shaker position and shake. Check whether the speed is correct.



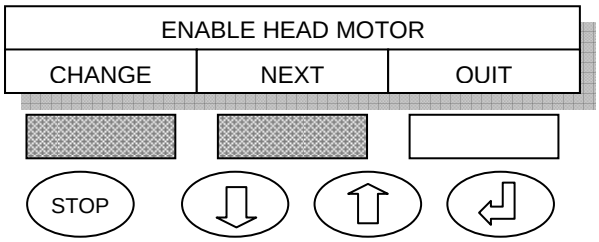
If shaker speed is correct press SAVE *SK* to scroll through to the next menu. If the shaker speed is not correct press CHANGE *SK*.



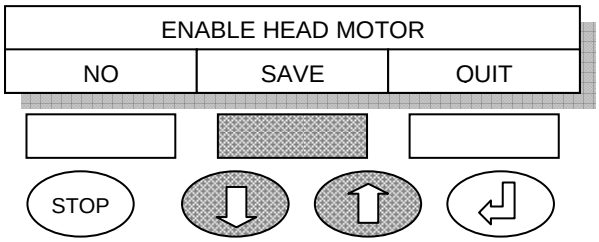
Use the up/down keys to change the speed. Press TEST *SK* to check whether the shaker speed is correct.



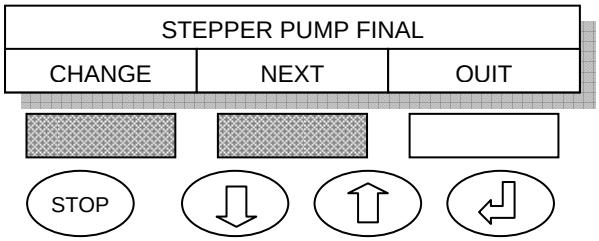
If shaker speed is correct press SAVE *SK* to scroll through to the next menu. If the shaker speed is not correct press CHANGE *SK* and repeat above steps.



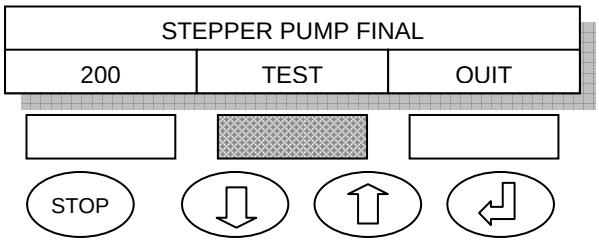
Press CHANGE *SK* to enable the head motor or NEXT *SK* to scroll through to the next menu.



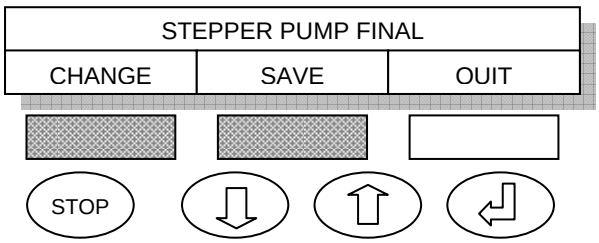
Use the up/down keys to toggle between 'YES' or 'NO'. Press SAVE *SK* to scroll through to the next menu.



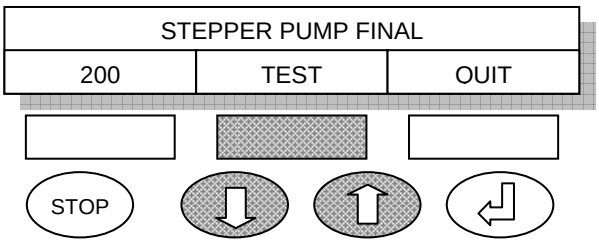
STEPPER PUMP FINAL is the speed in which the peristaltic pump spins. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



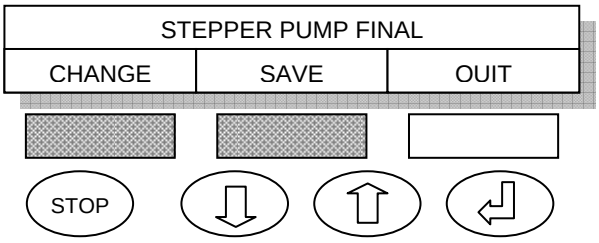
Press TEST *SK* the peristaltic pump will spin. Check whether the speed is correct.



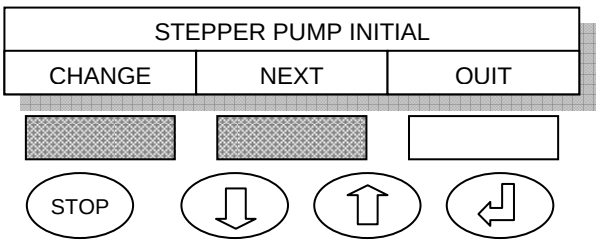
If pump speed is correct press SAVE *SK* to scroll through to the next menu. If the pump speed is not correct press CHANGE *SK*.



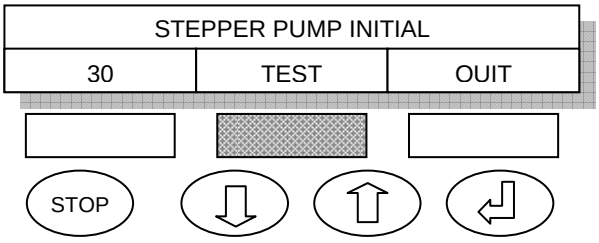
Use the up/down keys to change the speed. Press TEST *SK* to check whether the pump speed is correct.



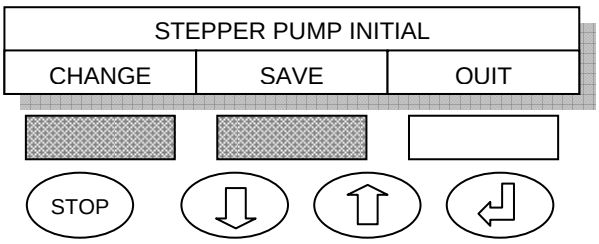
If pump speed is correct press SAVE *SK* to scroll through to the next menu. If the pump speed is not correct press CHANGE *SK* and repeat above steps.



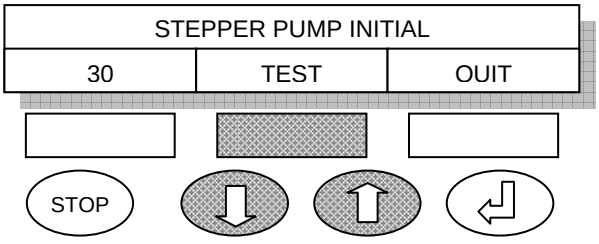
STEPPER PUMP INITIAL is the acceleration in which the pump accelerates. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



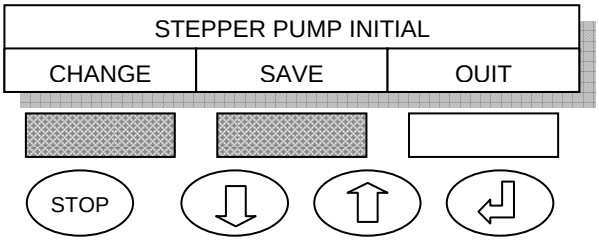
Press TEST *SK* the pump will spin. Check whether the acceleration is correct.



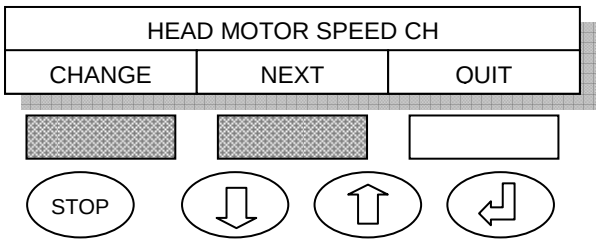
If pump acceleration is correct press SAVE *SK* to scroll through to the next menu. If the pump acceleration is not correct press CHANGE *SK*.



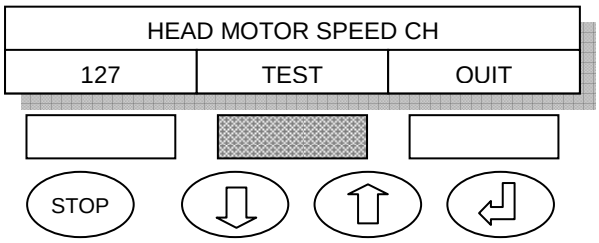
Use the up/down keys to change the acceleration. Press TEST *SK* to check whether the pump acceleration is correct.



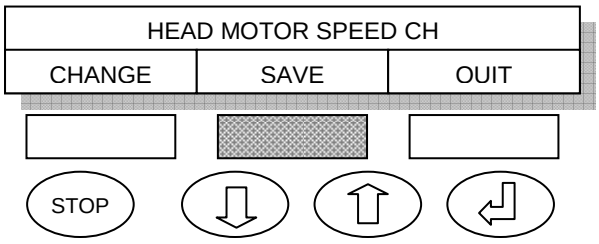
If pump acceleration is correct press SAVE *SK* to scroll through to the next menu. If the pump acceleration is not correct press CHANGE *SK* and repeat above steps.



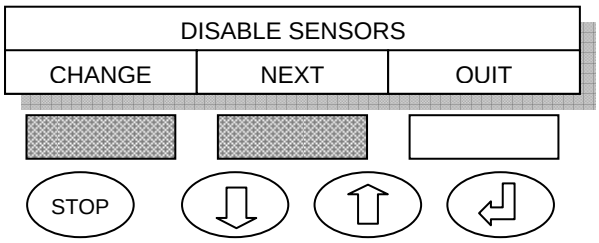
This menu will not appear if you chose N0 in the enable head motor menu, i.e. no head motor. Press CHANGE *SK* to enter this procedure. Press NEXT *SK* to scroll through to the next menu.



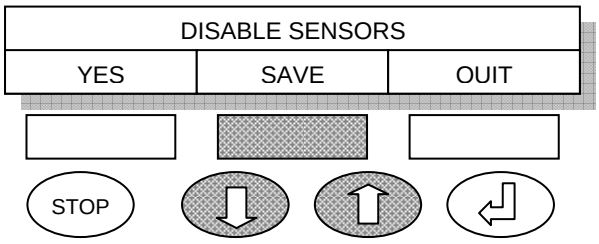
Press TEST *SK* the head motor wont turn.



Press SAVE *SK* to scroll through to the next menu.



Press CHANGE *SK* to disable the level sensors or NEXT *SK* to scroll through to the next menu.



Use the up/down keys to toggle between ‘YES’ or ‘NO’ Press SAVE *SK* to scroll through to the next menu.

15 Appendix B - Hardware information for the Service Engineer

Autura has a microprocessor of type Winbond W78E516B40PL. This is located on the PCB behind the front cover. It is programmable via the USB socket.

The PCB also contains an eeprom that is rewritten with new hardware settings through the engineering menus. This eeprom is not replaceable.

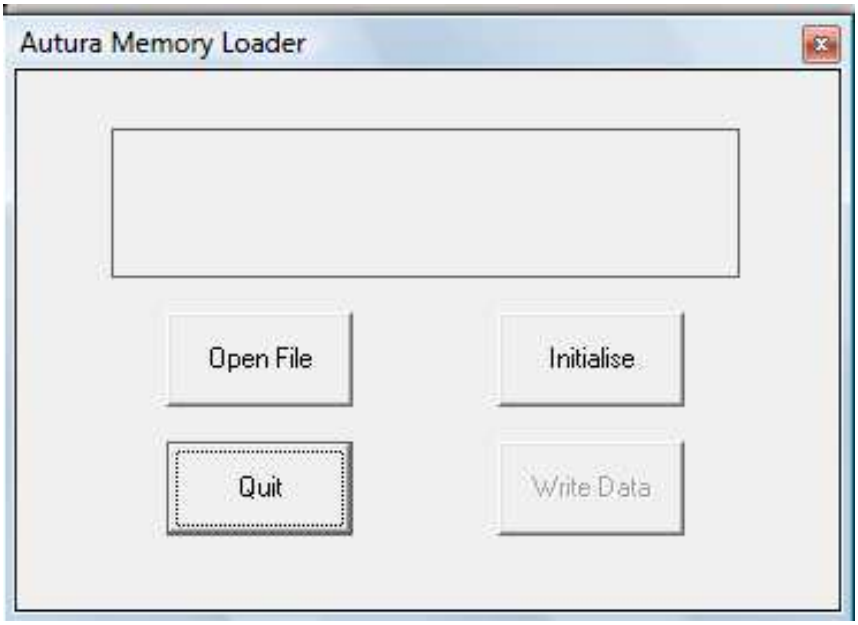
16 Appendix C - Upgrading software via USB socket

The USB Interface CD contains all the software required for uploading new software versions to the Autura 500 filler from a PC running all versions of Windows 9X to Windows Vista.

To install the software, copy the folder called PC Software from the CD to your local HD. Quit all other applications. Open the folder and create a shortcut for Autura memory loader to your desktop.

The Autura is equipped with a USB type B socket. Connect your Autura Filler 500 to your PC using an USB type A to type B cable. Connect USB cable to Autura first then to the computer.

Switch on your Autura and launch the Autura memory loader software application from your desktop.



Click the ‘Initialise’ button to start communication with your Autura. The Autura display will read Memory Loader Mode and the software will display Initialisation success.

Click the ‘Open File’ button and select the new CORE vXXX.hex file to upload. After opening the data the software will display:
File opened Ok
End of data:

Click the ‘Write Data’ button. The new software will be uploaded to the Autura. After the data has been sent and verified the software will be displaying Programming Successful.
The Autura will return to the main menu.

Click the ‘Quit’ button to close the program.

Switch off your Autura and unplug the USB cable.